

FULLY SPRINKLERED

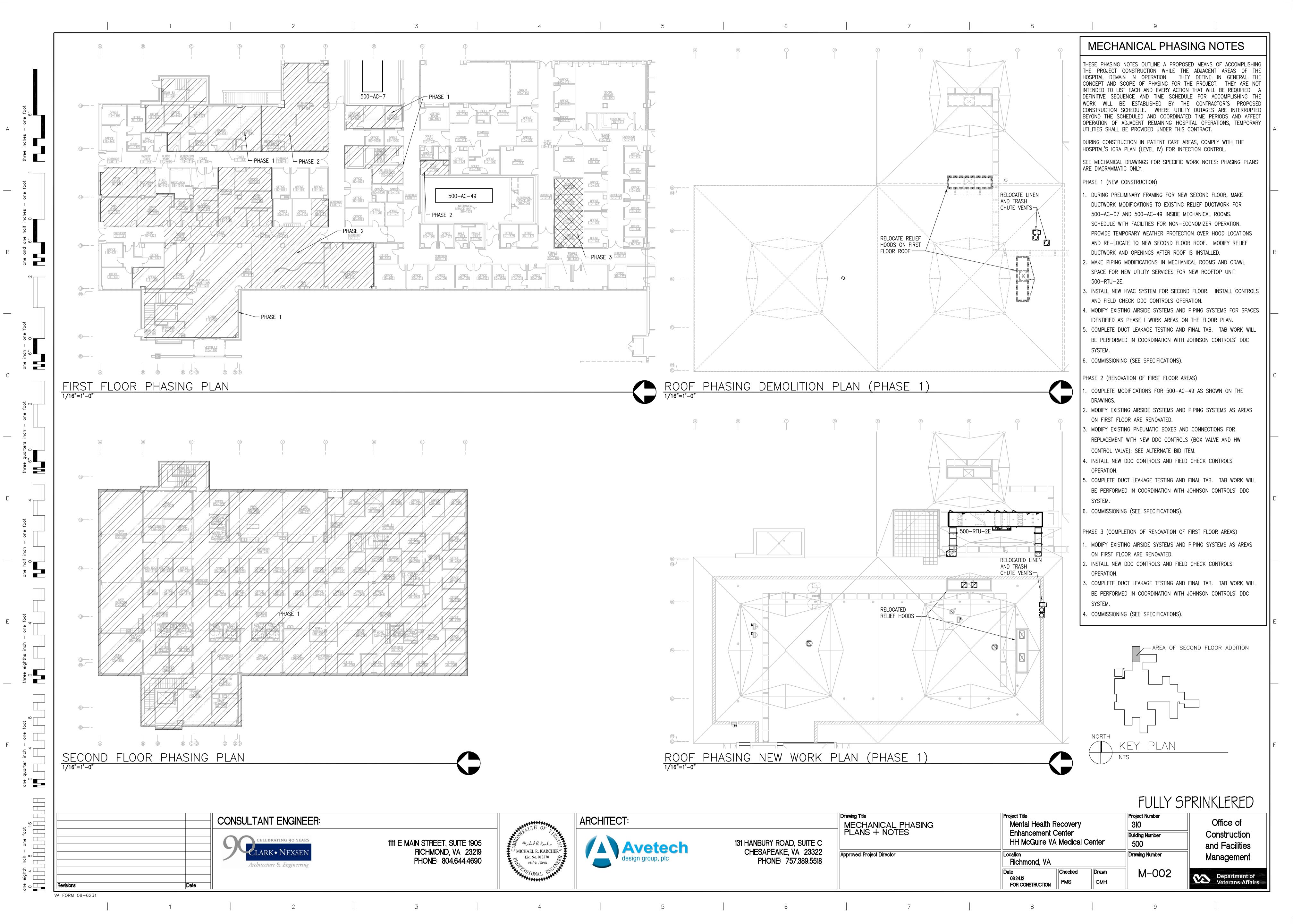
Drawing Title ARCHITECT: CONSULTANT ENGINEER: Office of Mental Health Recovery MECHANICAL LEGEND + NOTES **Enhancement Center** Construction **Building Number** HH McGuire VA Medical Center 1111 E MAIN STREET, SUITE 1905 131 HANBURY ROAD, SUITE C 500 and Facilities RICHMOND, VA 23219 CHESAPEAKE, VA 23322 CLARK• NEXSEN MICHAEL R. KARCHER Approved: Project Director Drawing Number Location Management Lic. No. 013270 PHONE: 804.644.4690 PHONE: 757.389.5518 Richmond, VA 08/21/2012 Architecture & Engineering Department of Veterans Affairs 08.24.12 СМН FOR CONSTRUCTION

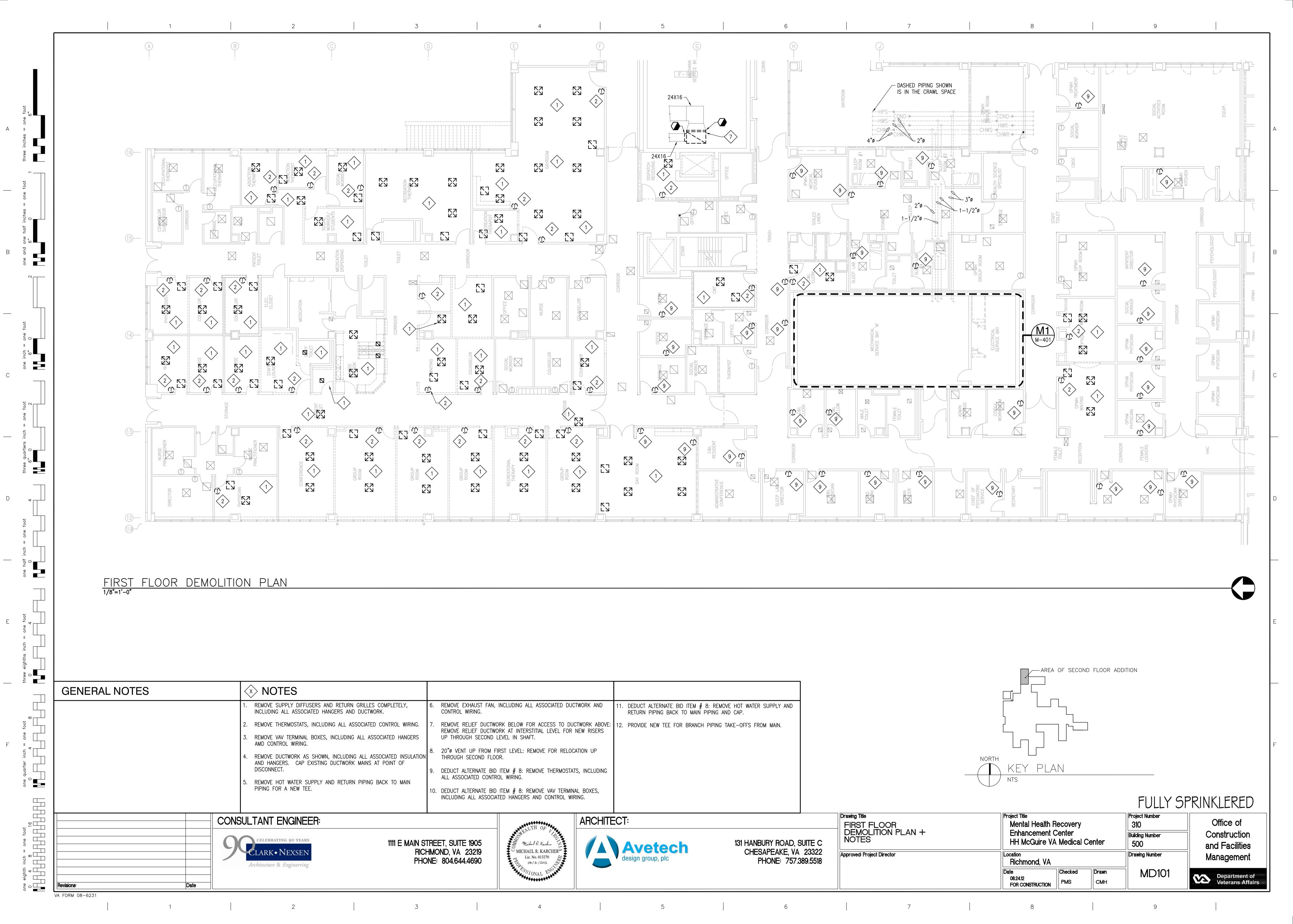
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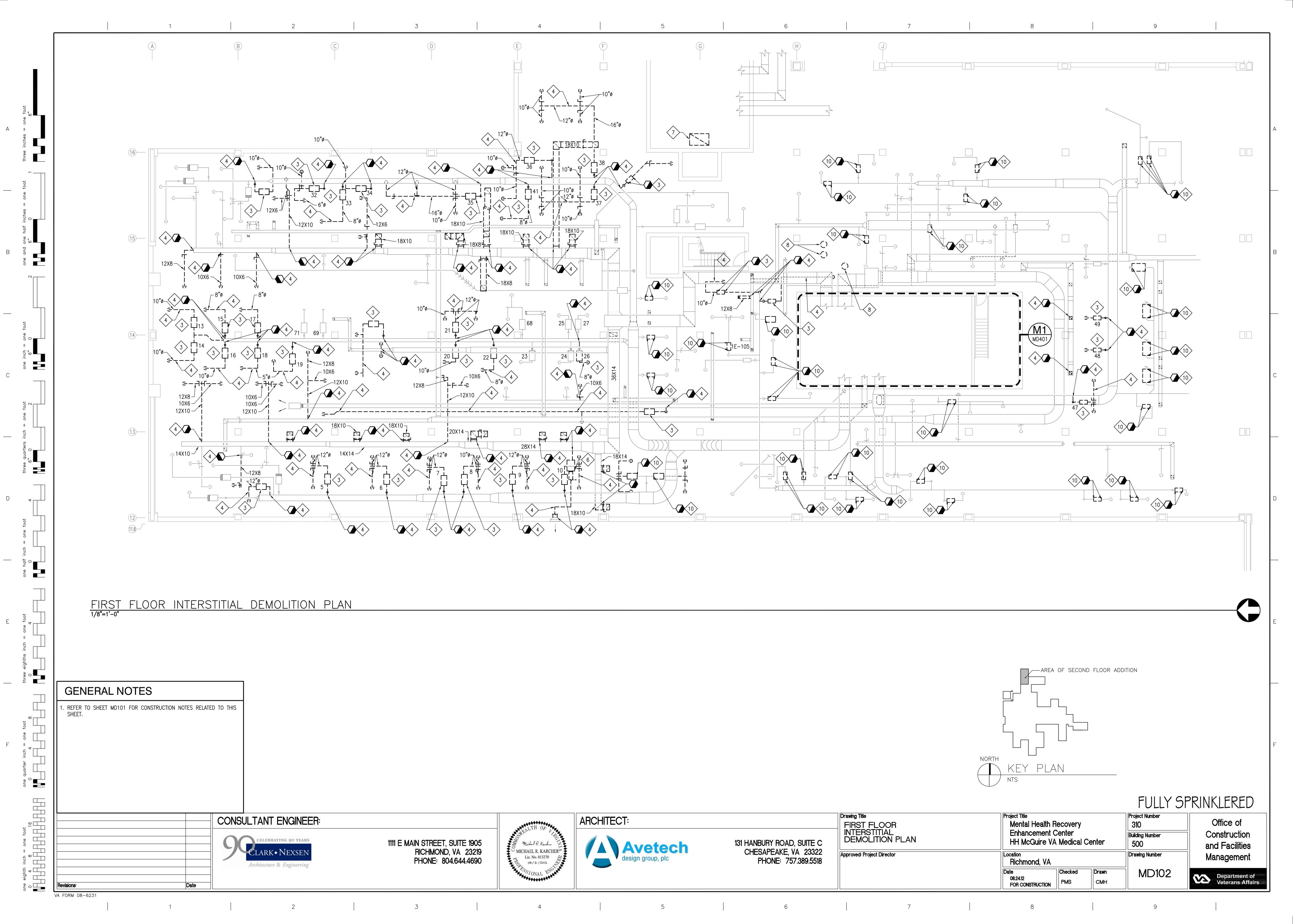
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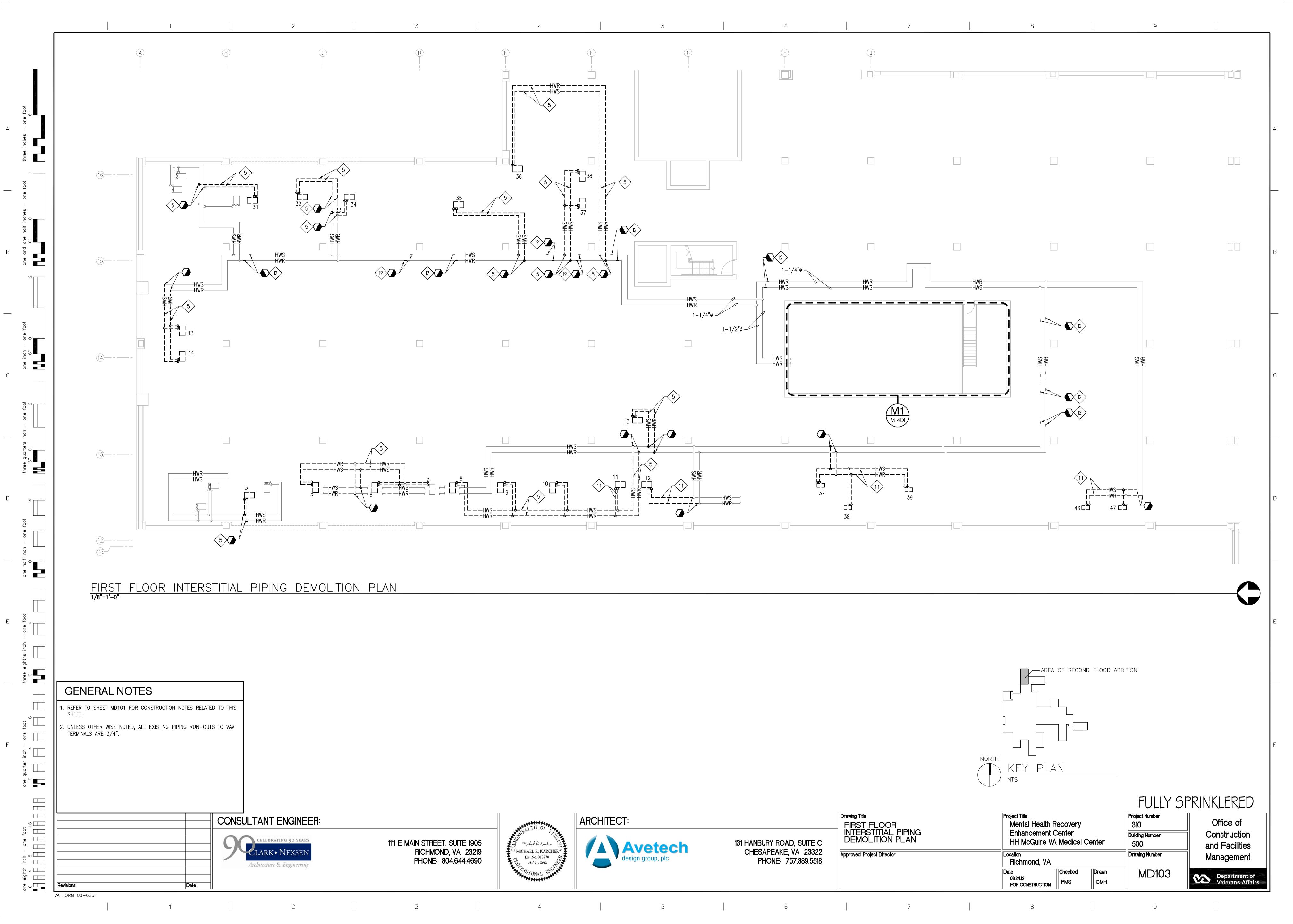
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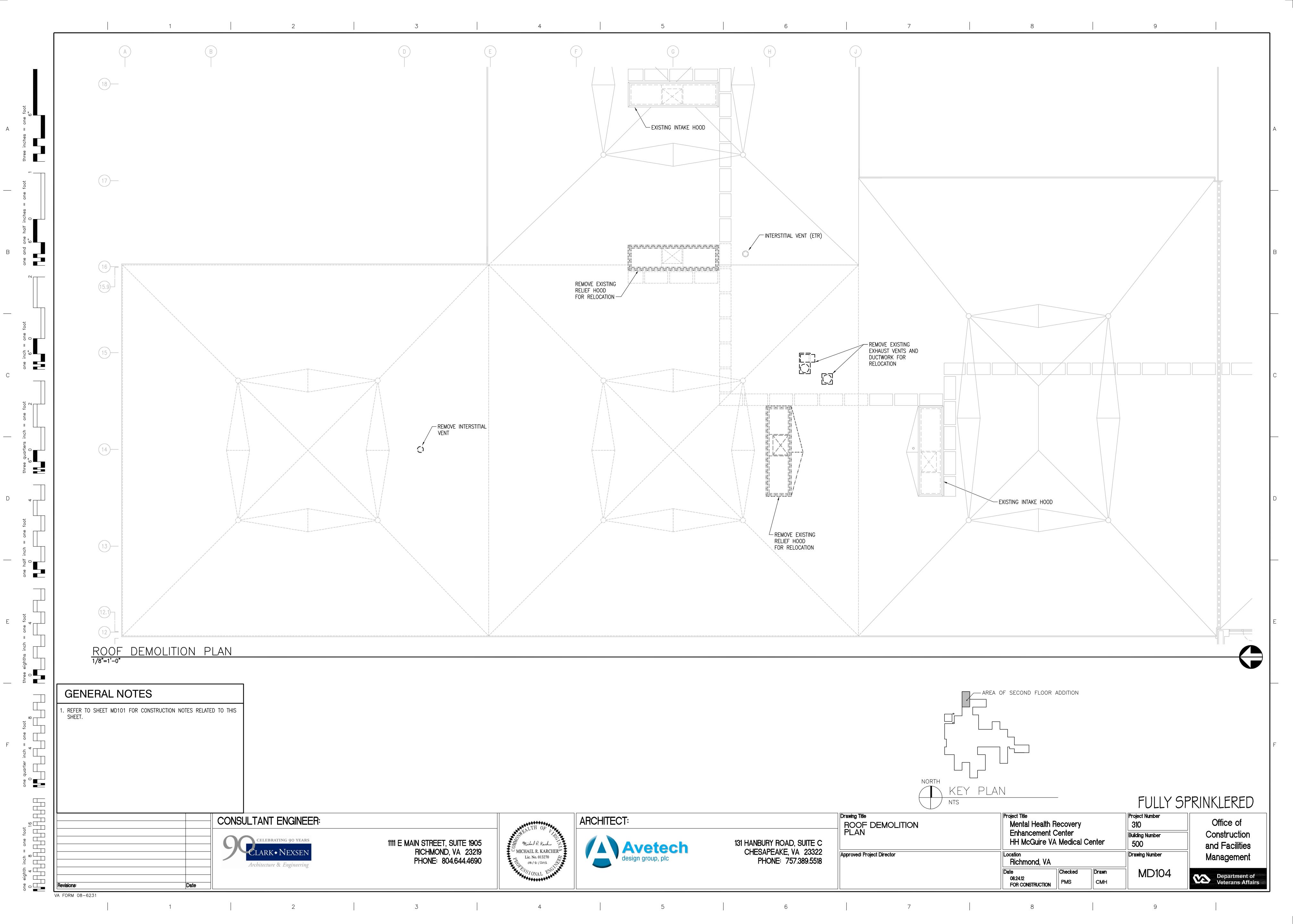
VA FORM 08-623

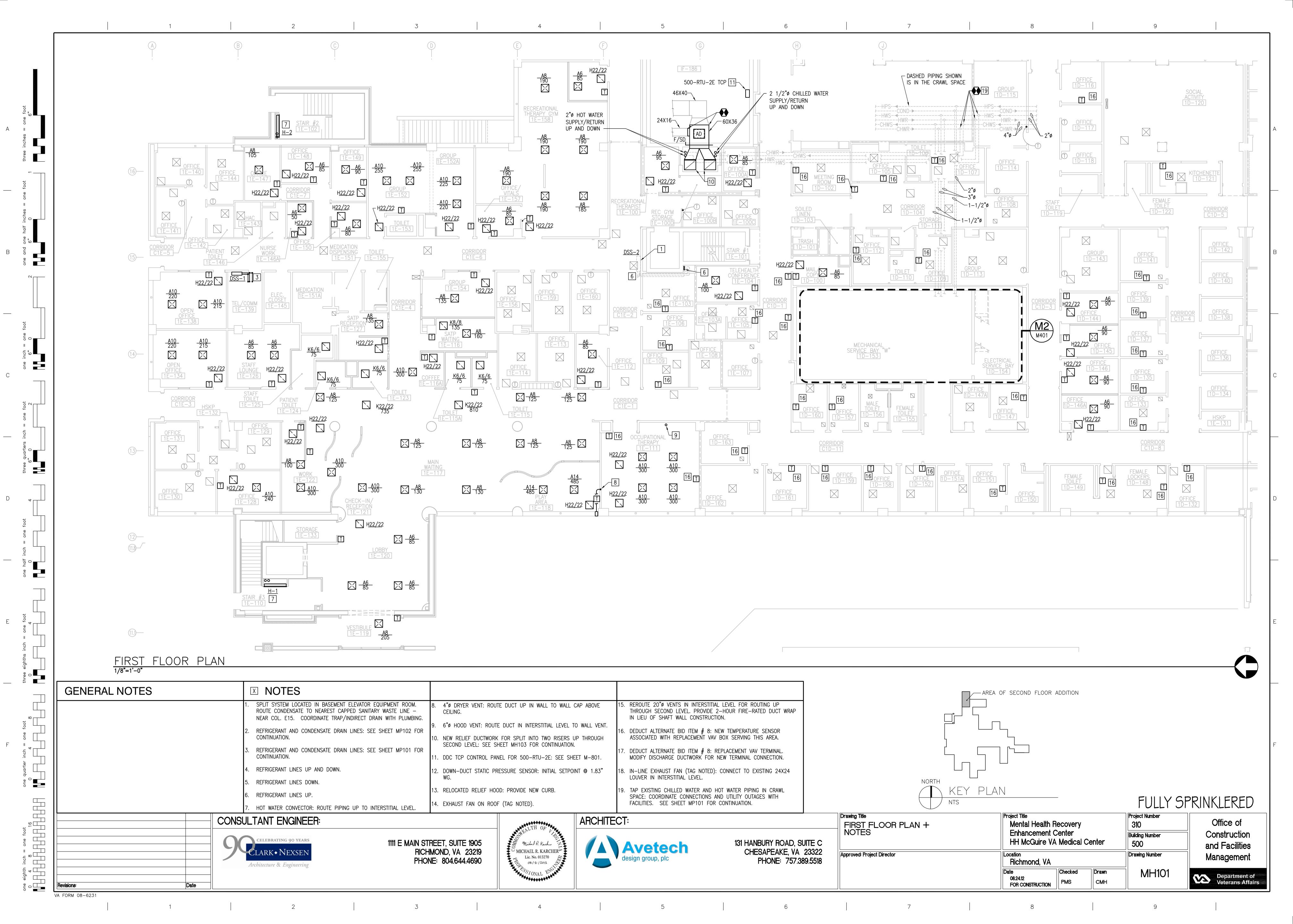


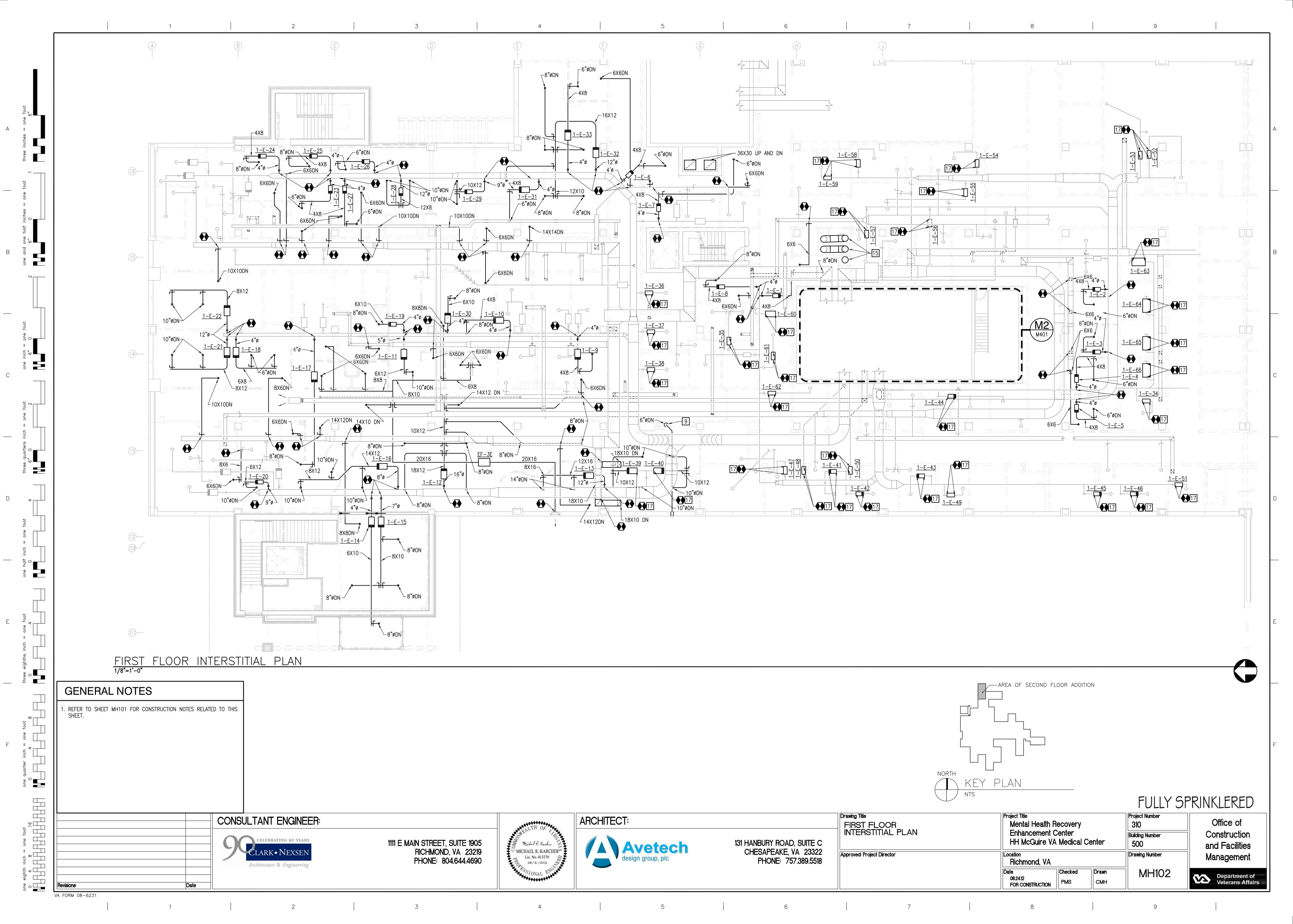


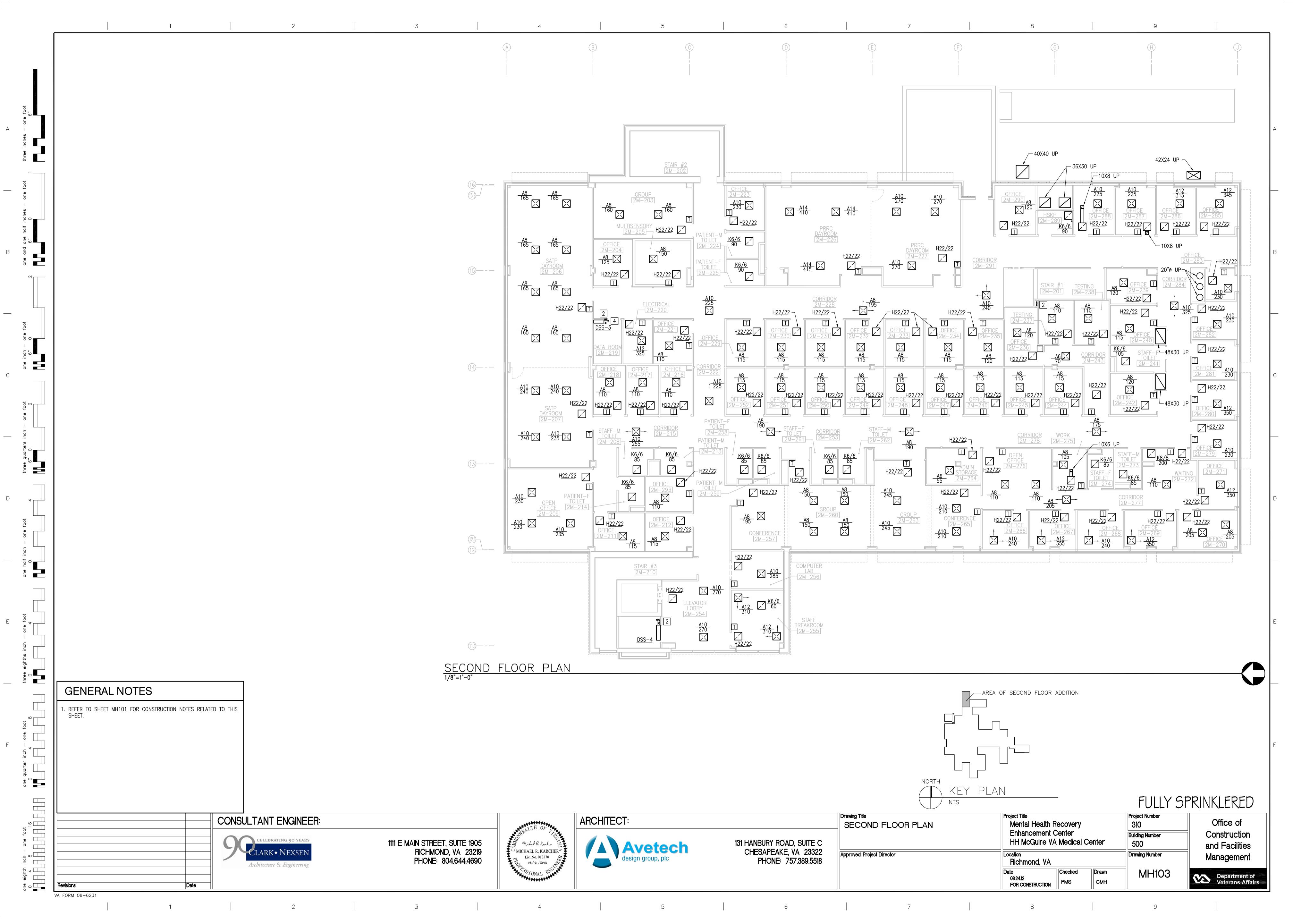


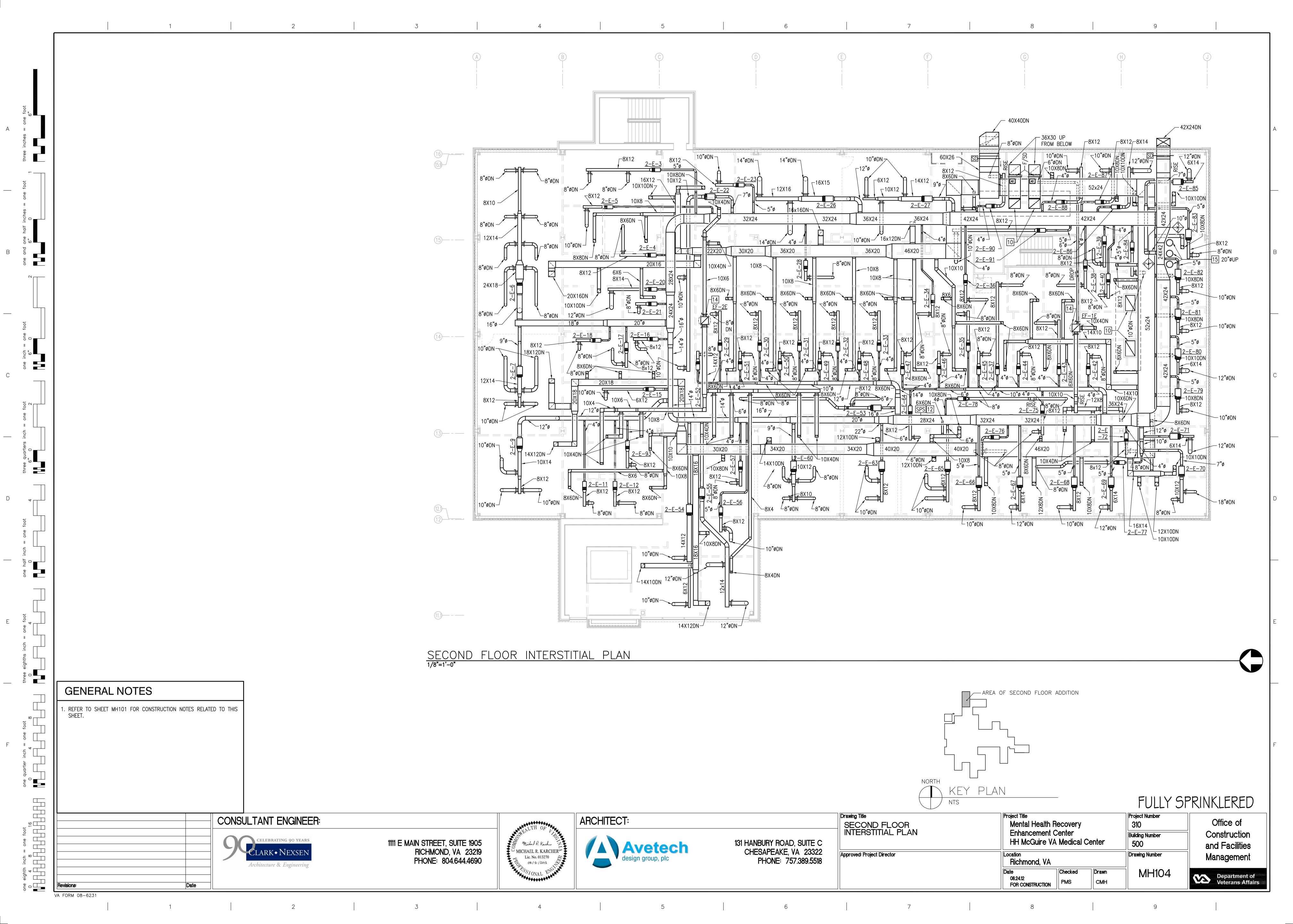


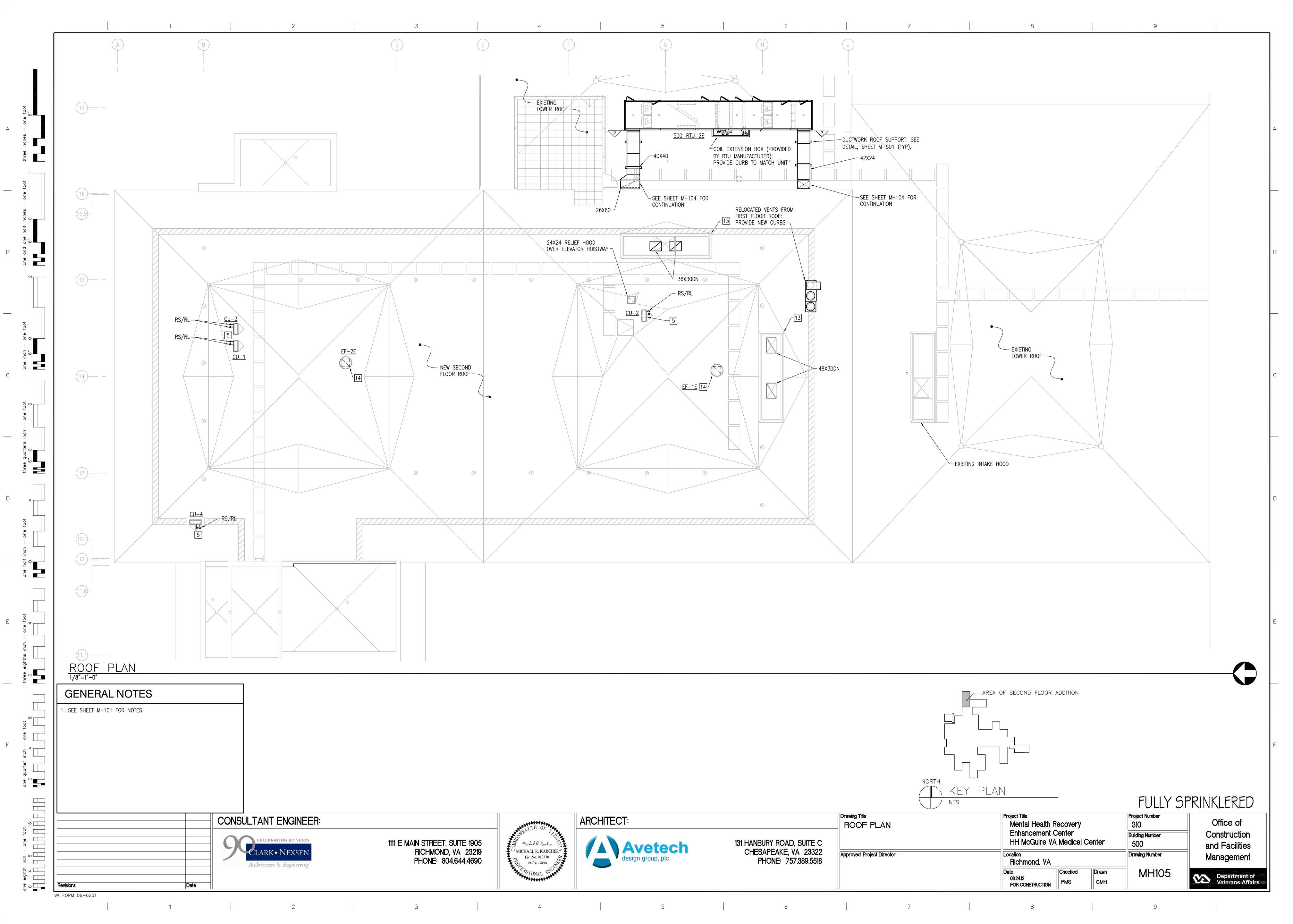


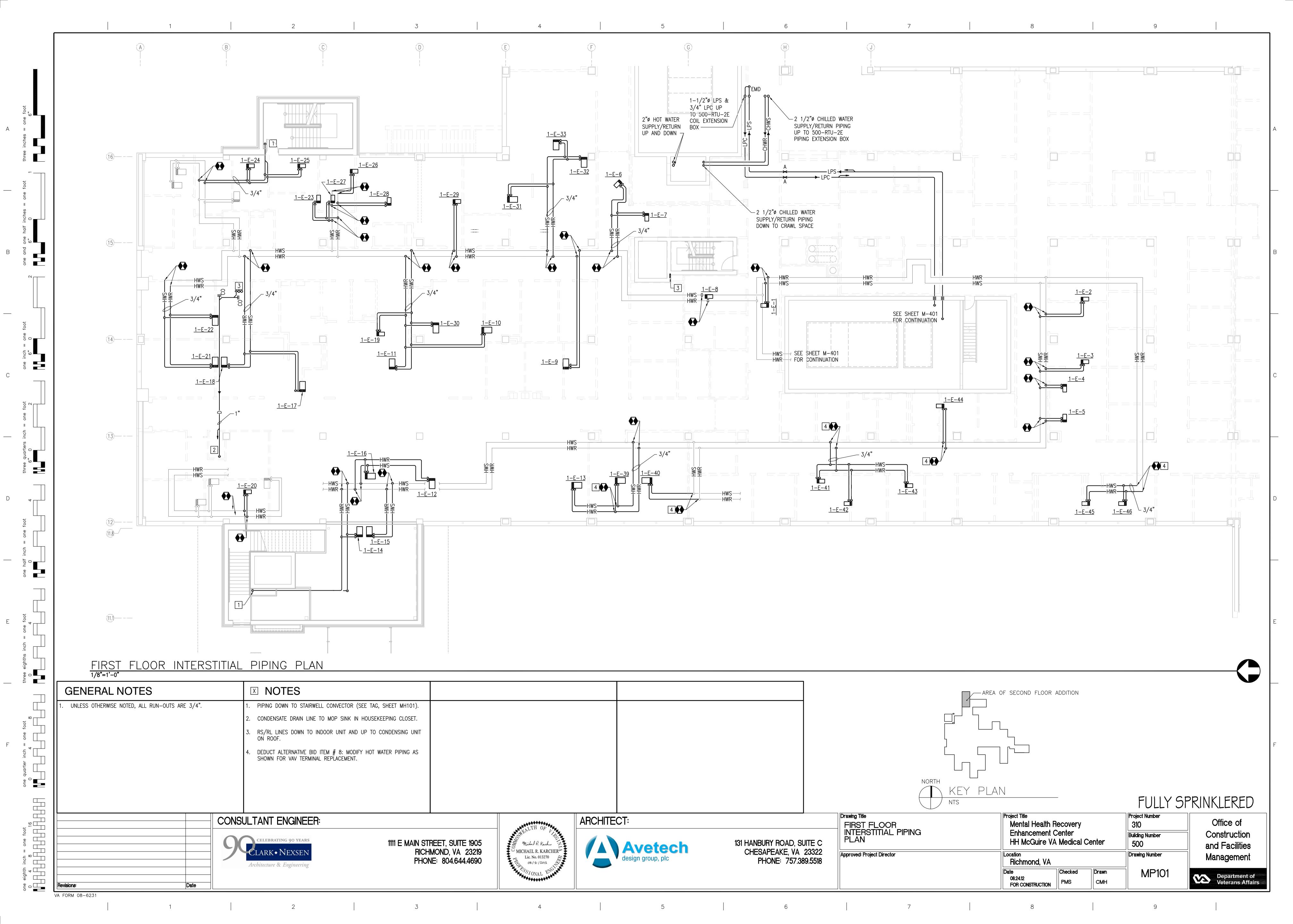


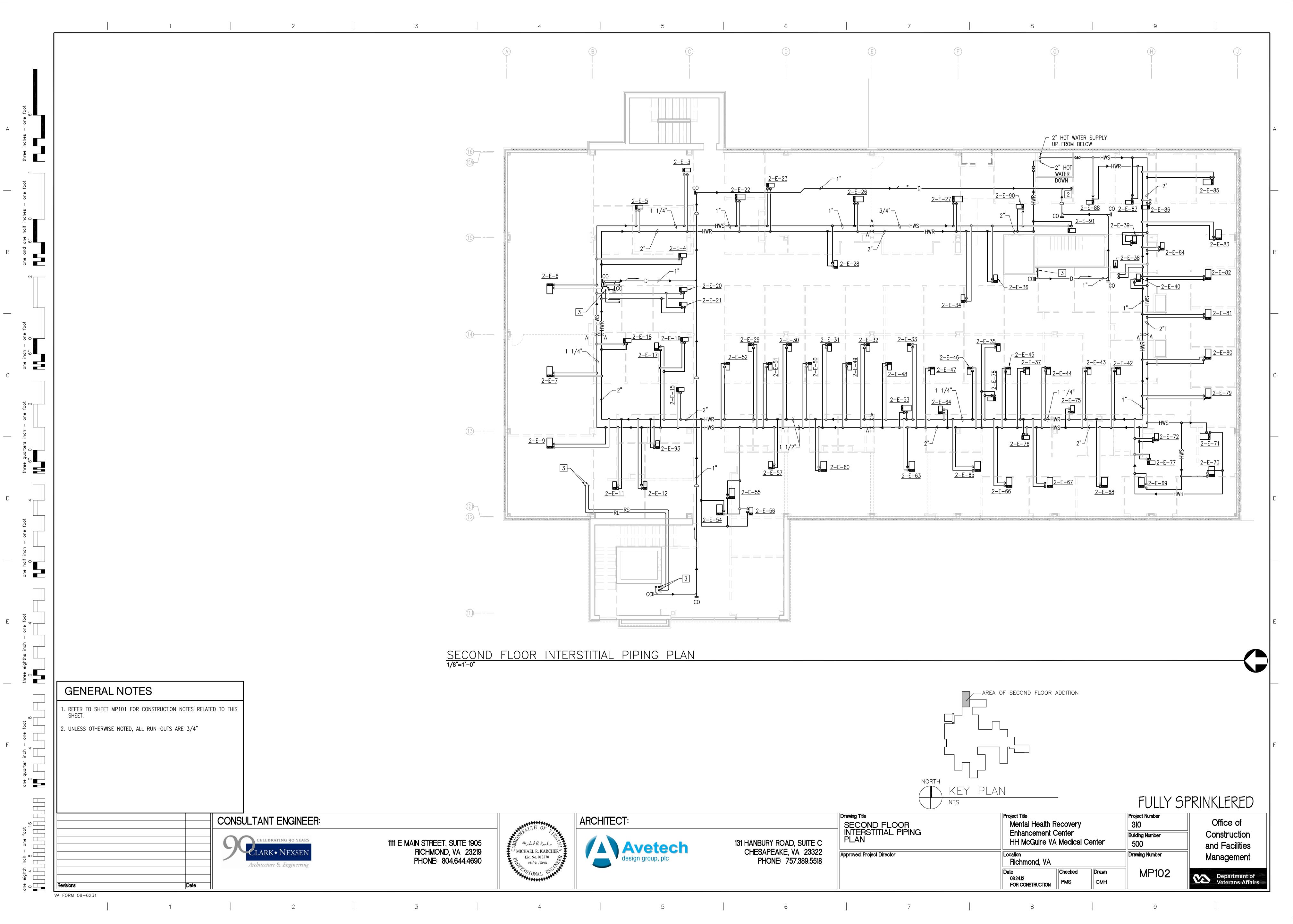


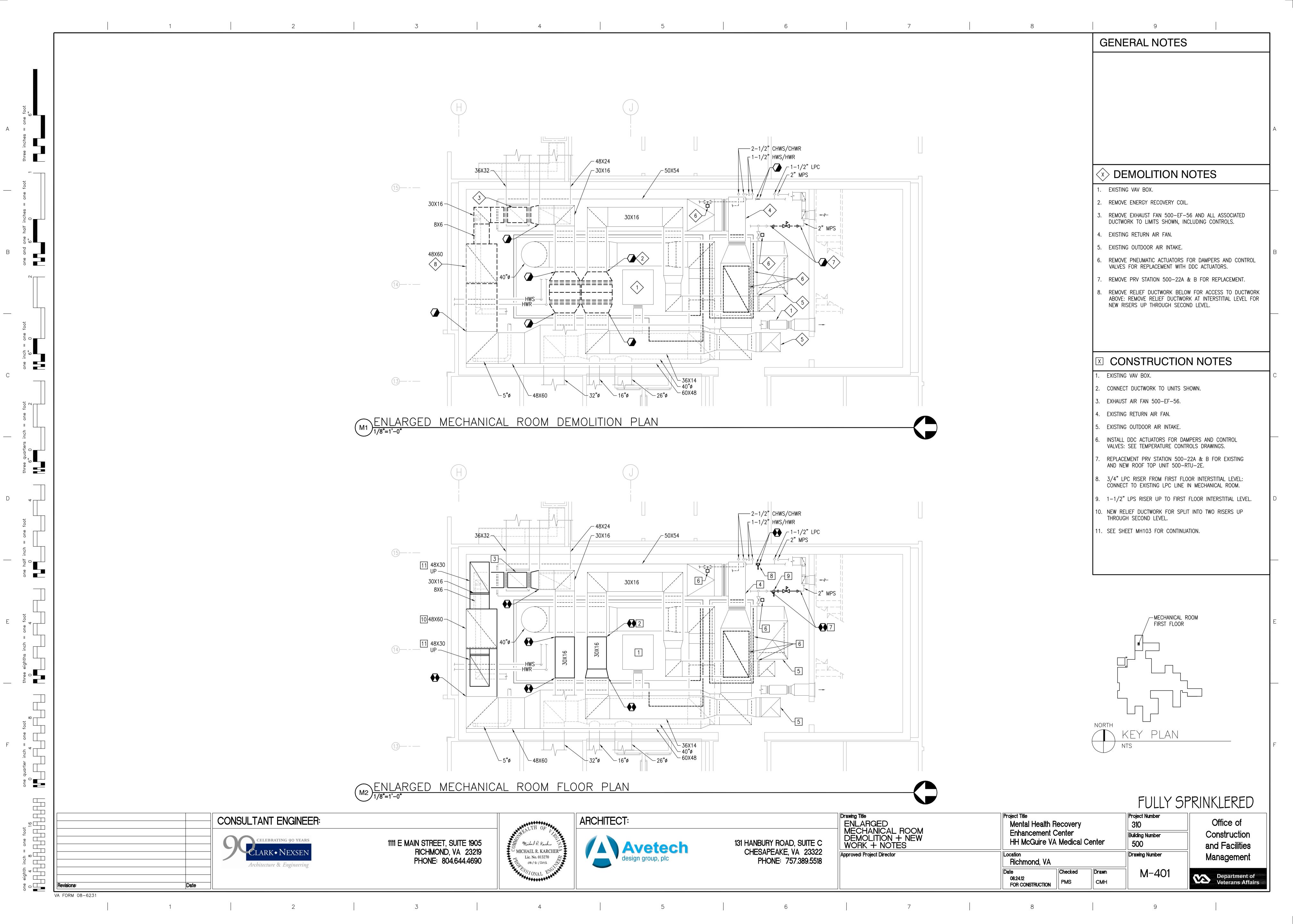


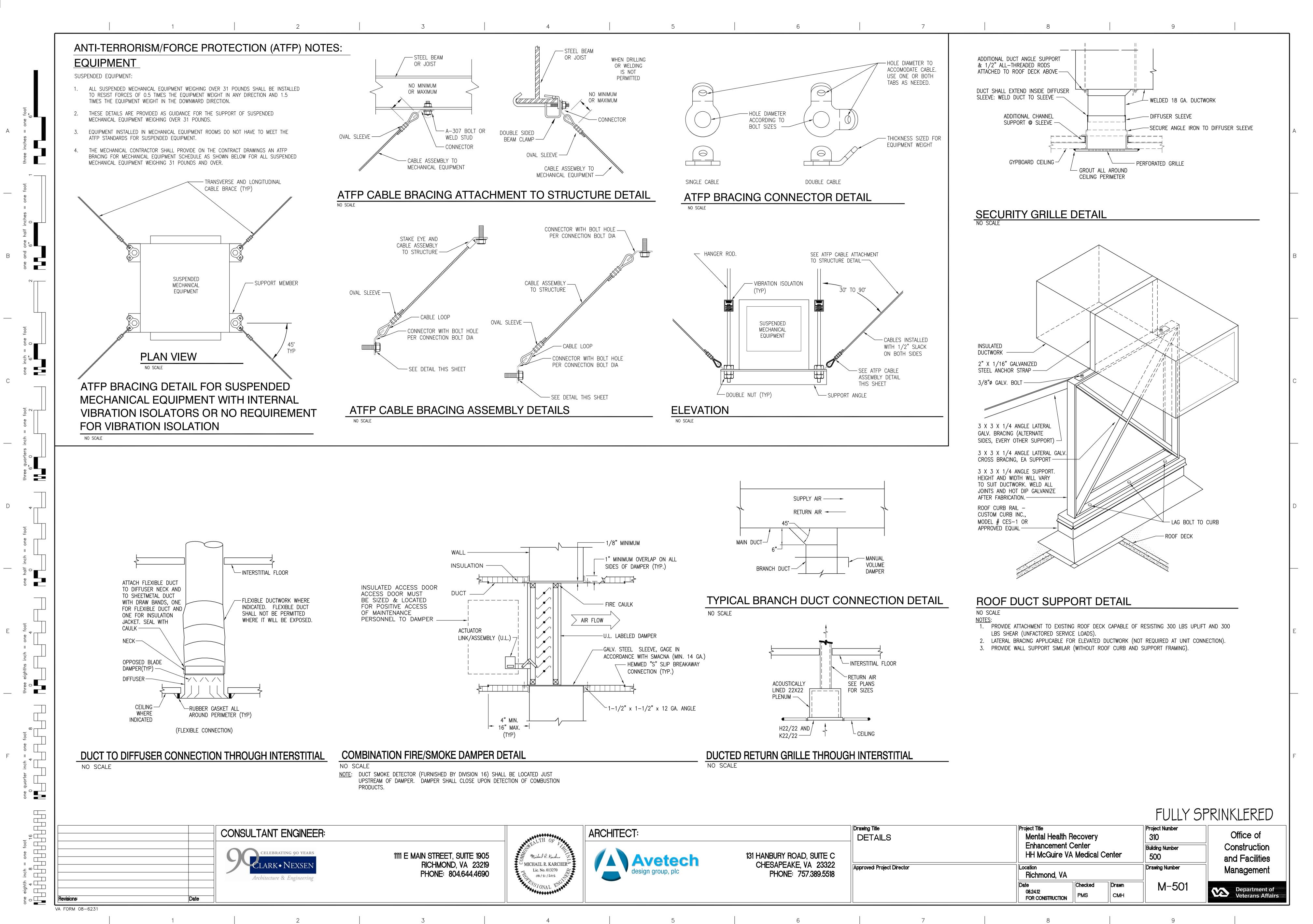












STEAM TRAP SCHEDULE PRESSURE LOCATION (LB/HR) (PSIG) (PSIG) INTERSTITIAL LEVEL 1 5 0.25 F&T INTERSTITIAL LEVEL 1 500-RTU-2E HUMIDIFIER 500-RTU-2E PRE-HEAT COIL 3,300 5 0.25 F&T INTERSTITIAL LEVEL 1

CONVECTION HEATERS								
			WATER 1	TEMP (°F)	CDM	MIN		
MARK	LOCATION	TYPE	ENT.	LVG.	GPM	CAPACITY (MBH)		
H-1	STAIR #3	CONVECTOR	120	100	2.0	4.0		
H-2	STAIR #2	CONVECTOR	120	100	2.0	4.0		
NOTES:	OTES: 1. BASED ON TRANE MODEL RG WALL MOUNTED RECESSED UNIT.							
2. INSTALL PER MANUFACTURERS RECOMMENDATIONS.								
3. CABINET FRONT AND TOP PANELS SHALL BE 14 GAUGE STEEL								

		DIF	FUSERS, F	REGISTE	RS, AND GRILLES SCHE	DULE		
MARK	CFM RANGE	MAX SP	NECK/COLLAR	SHELL	MOUNTING/TYPE	MAX.THROW AT	MAX	NOTES
		(IN WG)	SIZE (IN)	SIZE (IN)		50 FPM (FT)	NC	
A6	0-98	0.04	6	24 X 24	LAY-IN PERFORATED FACE	6	10	1,2
A8	99-209	0.07	8	24 X 24	LAY-IN PERFORATED FACE	10	22	1,2
A10	210-309	0.07	10	24 X 24	LAY-IN PERFORATED FACE	11	25	1,2
A12	310-393	0.09	12	24 X 24	LAY-IN PERFORATED FACE	15	25	1,2
A14	394-489	0.08	14	24 X 24	LAY-IN PERFORATED FACE	17	25	1,2
H22/22	0-1625	0.10	22 X 22	24 X 24	LAY-IN PERFORATED FACE	-	25	3
K6/6	0-125	0.09	6 X 6	12 X 12	SURFACE MOUNT PERFORATED FACE	-	10	3,5
K8/8	126-233	0.10	8 X 8	16 X 16	SURFACE MOUNT PERFORATED FACE	-	15	4,5
K22/22	234-1625	0.10	22 X 22	24 X 24	SURFACE MOUNT PERFORATED FACE	-	25	4,5

- NOTES: 1. BASED ON TITUS MODEL # PAS OR APPROVED EQUAL.
 - 2. PATTERN: ADJUSTABLE 4-WAY CORE STYLE: INSTALL AS INDICATED ON PLANS.
 - 3. BASED ON TITUS MODEL # SS-PR SECURITY GRILLE OR APPROVED EQUAL.
 - 4. BASED ON TITUS MODEL # PAR OR APPROVED EQUAL.
 - 5. THE SHELL SIZE OF SURFACE MOUNT SHALL BE ADDED 1".

DX SPLIT SYSTEM SCHEDULE													
			SUPPLYF	FAN DATA		COOLING	G CAPA	СПҮ		SPLIT SYS			
					TOTAL	SENSIBLE	ENTE	RING		MA DIZ			
MARK	TYPE	LOCATION	TOTAL	MAX	COOLING	COOLING	AIR	(°F)	MIN SEER	MARK (OUTDOOR	LOCATION	САРАСПҮ	NOTES
			CFM	HP	(MBH)	(MBH)	DB	WB		UNIT)			
DSS-1	WALL MOUNTED	TELECOM 1E-139	400	1.0	9.0	9.0	75.0	62.5	21.0	CU-1	ROOF	MATCH INDOOR UNIT	1,2,3,4,5
DSS-2	WALL MOUNTED	BASEMENT ELEV EQUIP	850	5.0	30.0	30.0	75.0	62.5	16.0	CU-2	ROOF	MATCH INDOOR UNIT	1,2,3,4,6
DSS-3	WALL MOUNTED	TELECOM 2M-219	400	1.0	9.0	9.0	75.0	62.5	21.0	CU-3	ROOF	MATCH INDOOR UNIT	1,2,3,4,5
DSS-4	WALL MOUNTED	2ND FL ELEV EQUIP RM	850	5.0	30.0	30.0	75.0	62.5	16.0	CU-4	ROOF	MATCH INDOOR UNIT	1,2,3,4,6

- NOTES: 1. PROVIDE MANUFACTURER'S CONTROL PACKAGE.
 - 2. OUTDOOR UNIT CONDENSER ENTERING AIR TEMPERATURE = 95 °F
 - 3. MANUFACTURER SHALL SIZE REFRIGERANT LINES.
 - 4. OVERFLOW SENSOR IN DRAIN PAN.
 - 5. INDOOR UNIT BASED ON MITSUBISHI MODEL # MSY-GE09NA, OUTDOOR UNIT MODEL # MUY-GE09NA.
 - 6. INDOOR UNIT BASED ON MITSUBISHI MODEL # MSY-D30NA, OUTDOOR UNIT MODEL # MUY-D30NA.

DUCT CONSTRUCTION AN	ND LEA	K CLAS	SIFICATION	ON SCHEDU	LE
SYSTEM	TYPE OF PRESSURE	SMACNA PRESSURE CLASS (IN WG)	SEAL CLASSIFICATION (PER SMACNA)	TYPE OF DUCTWORK	LEAKAGE CLASS (CFM/100 SQ FT AT 1 IN WG)
SUPPLY AIR DUCTWORK:					
ROM VAV AIR HANDLING UNIT TO INLET OF VAV TERMINAL UNIT	POSITIVE	+3	А	RECTANGULAR	12
TOW VIV ARTIMODERA OF THE RELET OF VIV TERMINATE OF THE	TOOMVE	10	^^	ROUND & FLAT OVAL	6
ROM VAV TERMINAL UNIT TO SUPPLY OUTLETS	POSITIVE	+2	A	RECTANGULAR	24
			,,	ROUND & FLAT OVAL	12
FROM FAN COIL UNIT TO SUPPLY OUTLETS	POSITIVE	+2	A	RECTANGULAR	24
			, ,	ROUND & FLAT OVAL	12
FROM ENERGY RECOVERY UNIT TO SUPPLY OUTLETS	POSITIVE	+2	A	RECTANGULAR	24
	1 332		, ,	ROUND & FLAT OVAL	12
RETURN AIR DUCTWORK:	_	_			
ALL RETURN AIR DUCTWORK	NEGATIVE	-2	A	RECTANGULAR	24
		_	, ,	ROUND & FLAT OVAL	12
EXHAUST & OUTSIDE AIR DUCTWORK:			_		
DUCTWORK UNDER POSITIVE CONDITIONS	POSITIVE	+2	A	RECTANGULAR	24
OCTIVERY GINDERT COMMITTEE	TOSHIVE	72	^	ROUND & FLAT OVAL	12
DUCTWORK UNDER NEGATIVE CONDITIONS	NEGATIVE	-2	A	RECTANGULAR	24
OCTIVORY GINDER NEGATIVE CONDITIONS	NEOATIVE	-2		ROUND & FLAT OVAL	12
RANSFER & RELIEF DUCTWORK:					
DUCTWORK UNDER POSITIVE CONDITIONS	POSITIVE	+2	A	RECTANGULAR	24
TOO TWO KIND ENT COMPLICATION	TOOMVE	12	^	ROUND & FLAT OVAL	12
DUCTWORK UNDER NEGATIVE CONDITIONS	NEGATIVE	-2	A	RECTANGULAR	24
OSTA SIA SIA SIA SIA SIA SIA SIA SIA SIA SI	1420/1111/2			ROUND & FLAT OVAL	12

	EXHAUST FAN SCHEDULE										
MARK	LOCATION	TYPE	CFM	ESP	RPM	SONES	DRIVE	MOTOR	NOTES		
W// CECE	200/(11014	1112	OI W	(IN WG)	TXI IVI	OONLO	DITIVE	HP	140120		
EF-1E	SECOND FLOOR ROOF	CENTRIFUGAL ROOF	595	0.375	1550	10.7	DIRECT	1/8	1,2		
EF-2E	SECOND FLOOR ROOF	CENTRIFUGAL ROOF	875	0.375	1140	6.9	DIRECT	1/6	1,3		
EF-3E	FIRST FLOOR INTERSTITIAL	INLINE EXHAUST	2,160	0.400	830	10.2	BELT	1/3	1,4		
500-EF-56	MECHANICAL ROOM	INLINE EXHAUST	4,100	0.750	410	28.0	BELT	1 1/2	1,5		

- 1. DESIGN BASIS MANUFACTURER LOREN-COOK: PROVIDE WITH HURRICANE-RATED CURB, BDD & DISCONNECT SWITCH.
- 2. CFM LISTED INCLUDES 1.05 SAFETY FACTOR: BALANCE FOR 565 CFM. BASED ON LOREN COOK MODEL 100C15DH.
- 3. CFM LISTED INCLUDES 1.05 SAFETY FACOTR: BALANCE FOR 835 CFM. BASED ON LOREN COOK MODEL 120C11D.
- 4. CFM LISTED INCLUDED 1.05 SAFETY FACTOR: BALANCE FOR 2055 CFM. BASED ON LOREN COOK MODEL 195 SQN-HP.
- 5. BASED ON LOREN COOK MODEL 402 SQN-HP.

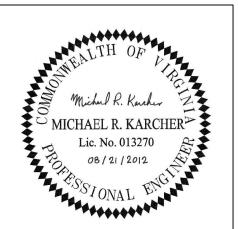
	AIR-HANDLING/ROOFTOP UNIT SCHEDULE																																								
		TOTAL		SUPPLYF	AN CAPACITY			SUPPLY	FAN SOL	JND REQUIF	REMENTS	3	RETURN	FAN CAPA	СПҮ	R	ETURN FA	AN SOUN	ID REQUIR	EMENTS				ST	EAM PRE H	IEAT COIL						C	OOLING (COIL					FILTE	≟R	
MADIC	LOCATION	STATIC	MAX	(\	ОА		OUTL	_ET FAN S	OUND PC	WER (DB R	E:10-12 V	VATTS)			(OUTLET	FAN SOL	ND POW	/ER (DB RI	E:10-12 WAT	TS) TO	TAL	AIR		ENTERING		MAX	MAX CON	TROL		AIR		WATER	₹	MAX	MAX	CONTROL		PD (IN \	WG)	NOTES
MARK	LOCATION	PRESSURE	SUPPLY	(VAV) MIN SUPPLY AIR CFM	CFM ESP	MAX	x	ОСТА	VE BAND	FREQUEN	CY (HZ)		CFM	ESP M	1AX		OCTAVE	BAND F	REQUENC	CY (HZ)	HE	AT	TEMP. ((°F)	STEAM	MAX C	OIL PD	R PD VA	LVE	Т	EMP. (°F)		TEMP. (°F) MAX	COIL PD	AIR PD	VALVE	PRE-I	FILTER	FINAL	NOTES
		(IN WG)	AIR CFW	AIR CFIVI	MIN. (IN WO	G) HP	63	125 2	50 500	1000 20	00 4000	8000	(I	N WG)	HP (63 12	25 250	500	1000 200	00 4000 8	3000 (ME	BH) EN	NT. DB L	VG. DB	TEMP. (°F)	#/HR ((PSIG) (I	WG) (C	Cv) EN	NT. DB ENT. V	VB LVG. DE	B LVG. WB	ENT. LV	/G. GPM	(FT WG)	(IN WG)	(Cv)	INT.	FINAL	INT. FINA	L
500-AC-49	SERVICE BAY I-W-A	x	16,782	16,782	3,750 3.22	75.0	0 x	x	x x	x	x x	х	13,012	х	х	x x	х	х	x x	x	x >	x	х	х	Х	х	х	x	х	x x	х	х	х	x 125.5	x	х	x	х	х	х х	EXISTING - 1
500-RTU-2E	1F ROOF	5.0	16,365	9,995	2,700 2.5	30.0	0 82	83 9	90 77	77 7	6 73	67	14,200	0.75	6.0	69 7	76 76	62	64 60	0 53	39 760	0.0	56.5	94.3	227.1	790.9	5.0	0.14 15	5.0	79.7 65. ⁻	54.3	53.5	45.0 58	3.3 90.0	10.5	0.52	72.0	0.21	1.00	0.46 1.50	2, 3, 4, 5

- NOTES: 1. DATA SHOWN FOR 500-AC-49 BASED ON PRE-DESIGN TAB MEASUREMENTS.
 - 2. PRE-HEAT STEAM 15 PSIG AT CONTROL VALVE, 2 PSIG AT COIL.
 - 3. ESP DOES NOT INCLUDE PRESSURE DROP OF FILTERS OR COILS IN AHU
 - 4. DESIGN BASIS MANUFACTURER FOR ROOFTOP UNIT: THERMO-TROL
 - 5. SIZE SUPPLY FAN/DRIVE FOR 18,040 CFM AND RETURN FAN/DRIVE FOR 15,875 CFM

FULLY SPRINKLERED

CONSULTANT ENGINEER: CLARK • NEXSEN Architecture & Engineering

1111 E MAIN STREET, SUITE 1905 RICHMOND, VA 23219 PHONE: 804.644.4690



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ARCHITECT:

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131 HANBURY ROAD, SUITE C CHESAPEAKE, VA 23322 PHONE: 757.389.5518

Drawing Title
SCHEDULES Approved: Project Director

Project Title

Mental Health Recovery Project Number 310 **Enhancement Center** Building Number HH McGuire VA Medical Center 500 Location Richmond, VA Drawing Number

Office of Construction and Facilities Management

M-601 CMH

VA FORM 08-6231

one eighth inch = one foot

0 4 8 16

3

08.24.12 FOR CONSTRUCTION

Department of Veterans Affairs

VOL. REG. (CFM) **HEATING COIL** MAX CONTROL AIR TEMP WATER TEMP APD | VALVE | NOTES RADIATED MAX. MIN. HTG INLET SP ENT. LVG. ENT. LVG. GPM (FT) (IN. WG) (IN. WG) 125 1,2,3,4 1-E-55 420 1-E-56 EX 1,2,3,4 120 FIRST FLOOR SHUT OFF VARIABLE AIR VOLUME BOX SCHEDULE (1 OF 2) 1,2,3,4 1-E-57 EX 120 230 1,2,3,4 1-E-58 EX EX VOL. REG. (CFM) **HEATING COIL** 200 1,2,3,4 MAX MAX CONTROL 1-E-59 EX MAX. WATER TEMP DIA (IN) | INLET SP | RADIATED | MAX. | MIN. | 1,2,3,4 1-E-60 EX 120 APD | VALVE | NOTES 1-E-61 EX 1,2,3,4 ENT. 200 200 1,2,3,4 1-E-62 EX 1-E-1 85 | 65 | 65 | 55.0 | 87.0 | 120.0 | 111.0 | 0.5 | 1-E-63 EX 1,2,3,4 1-E-2 90 | 75 | 75 | 55.0 | 85.0 | 120.0 | 110.5 | 0.5 | 0.2 0.03 1,2,3,4 1-E-64 EX 1-E-3 90 | 75 | 75 | 55.0 | 85.0 | 120.0 | 110.5 | 0.5 | 0.2 1,2,3 1,2,3,4 1-E-65 EX 1-E-4 90 | 90 | 90 | 55.0 | 82.0 | 120.0 | 109.7 | 0.5 | 0.2 0.30 1,2,3 1-E-66 90 90 1,2,3,4 1-E-5 90 | 90 | 90 | 55.0 | 82.0 | 120.0 | 109.7 | 1.0 | 0.3 1,2,3 NOTES: 1. BASED ON TITUS MODEL DESV 95 | 95 | 95 | 55.0 | 80.0 | 120.0 | 109.3 | 0.5 | 1-E-6 0.03 2. DISCONNECT SWITCH. 85 | 60 | 60 | 55.0 | 89.0 | 120.0 | 111.4 | 0.5 | 0.2 1-E-7 3. PROVIDE ELECTRICAL POWER FOR STEP DOWN TRANSFORMER. 100 | 100 | 100 | 55.0 | 80.0 | 120.0 | 109.3 | 0.5 | 0.3 1-E-8 4. BID OPTION - REPLACEMENT OF PNEUMATIC VAV BOX 1-E-9 0.02 85 | 70 | 70 | 55.0 | 86.0 | 120.0 | 110.7 | 0.5 | 0.2 1-E-10 160 | 160 | 55.0 | 88.0 | 120.0 | 108.7 | 1.0 | 0.3 SECOND FLOOR SHUT OFF VARIABLE AIR VOLUME BOX SCHEDULE (1 OF 2) SECOND FLOOR SHUT OFF VARIABLE AIR VOLUME BOX SCHEDULE (2 OF 2) 1-E-11 300 | 275 | 275 | 55.0 | 80.0 | 120.0 | 105.3 | 1.0 | VOL. REG. (CFM) **HEATING COIL** 1-E-12 1,2,3 0.14 1135 | 1135 | 1135 | 55.0 | 81.0 | 120.0 | 100.0 | 3.5 MAX MAX CONTROL MAX CONTROL 1,2,3 1-E-13 970 | 600 | 600 | 55.0 | 91.0 | 120.0 | 100.0 | 2.3 | 0.28 12 0.29 MARK | DIA (IN) | INLET SP | RADIATED | MAX. | MIN. | APD VALVE APD VALVE 1-E-14 0.12 205 | 205 | 205 | 55.0 | 84.0 | 120.0 | 107.2 | 1.0 | 0.3 1,2,3 ENT. LVG. ENT. LVG. (IN. WG) (IN. WG) | NOISE (NC) GPM (FT) (IN. WG) 255 | 255 | 255 | 55.0 | 84.0 | 120.0 | 103.9 | 1.0 | 0.4 1,2,3 2-E-50 0.04 19 115 75 75 55.0 85.0 120.0 110.5 0.5 0.2 0.30 900 | 295 | 295 | 55.0 | 82.0 | 120.0 | 102.8 | 1.0 | 0.4 | 0.56 0.15 0.75 1,2,3 0.60 1-E-16 100 | 100 | 100 | 55.0 | 80.0 | 120.0 | 109.3 | 0.5 | 0.2 | 0.01 | 0.30 | 115 | 75 | 75 | 55.0 | 85.0 | 120.0 | 110.5 | 0.5 | 0.2 | 0.01 0.30 1-E-18 4 23 | 170 | 170 | 170 | 55.0 | 87.0 | 120.0 | 108.3 | 1.0 | 0.3 | 0.05 | 0.60 | 1,2,3 1320 | 935 | 935 | 55.0 | 84.0 | 120.0 | 103.1 | 3.5 | 0.8 | 0.12 380 | 200 | 200 | 55.0 | 85.0 | 120.0 | 107.3 | 1.0 | 0.3 | 0.20 20 | 135 | 95 | 95 | 55.0 | 81.0 | 120.0 | 109.5 | 0.5 | 0.2 | 0.02 | 0.30 | 1,2,3 1-E-19 4 955 | 515 | 515 | 55.0 | 83.0 | 120.0 | 107.5 | 2.5 | 1.1 | 0.32 | 540 | 340 | 340 | 55.0 | 86.0 | 120.0 | 105.0 | 1.5 | 0.5 | 0.12 20 | 240 | 105 | 105 | 55.0 | 91.0 | 120.0 | 112.0 | 1.0 | 0.2 | 0.01 | 0.60 | 1,2,3 1-E-20 695 | 400 | 400 | 55.0 | 87.0 | 120.0 | 101.6 | 1.5 | 0.6 | 0.10 | 0.90 685 | 205 | 205 | 55.0 | 94.0 | 120.0 | 108.6 | 1.5 | 0.5 | 0.18 14 | 435 | 300 | 300 | 55.0 | 92.0 | 120.0 | 104.2 | 1.5 | 0.6 | 0.05 | 0.90 | 1,2,3 23 | 285 | 120 | 120 | 55.0 | 92.0 | 120.0 | 110.4 | 1.0 | 0.3 | 0.12 115 | 75 | 75 | 55.0 | 94.0 | 120.0 | 112.5 | 0.5 | 0.2 | 0.01 | 0.30 14 | 435 | 300 | 300 | 55.0 | 92.0 | 120.0 | 104.2 | 1.5 | 0.6 | 0.05 | 0.90 | 1,2,3 1-E-22 12 24 | 195 | 150 | 150 | 55.0 | 89.0 | 120.0 | 109.1 | 1.0 | 0.3 | 0.06 50 | 50 | 50 | 55.0 | 92.0 | 120.0 | 112.1 | 0.5 | 0.2 | 0.01 | 0.30 | 1,2,3 1-E-23 15 | 600 | 370 | 370 | 55.0 | 85.0 | 120.0 | 104.4 | 1.5 | 0.5 | 0.14 18 | 105 | 80 | 80 | 55.0 | 84.0 | 120.0 | 110.2 | 0.5 | 0.2 | 0.01 | 0.30 | 1,2,3 1-E-24 0.03 | 110 | 65 | 65 | 55.0 | 89.0 | 120.0 | 111.4 | 0.5 | 0.2 | 0.01 | 490 300 300 55.0 83.0 120.0 111.0 2.0 1 0.32 2-E-63 6 1-E-25 4 15 | 85 | 70 | 70 | 55.0 | 86.0 | 120.0 | 110.7 | 0.5 | 0.2 | 0.01 | 0.30 | 1,2,3 110 | 65 | 65 | 55.0 | 89.0 | 120.0 | 111.4 | 0.5 | 0.2 | 0.01 | 55 | 45 | 45 | 55.0 | 94.0 | 120.0 | 112.5 | 0.5 | 0.2 | 0.01 90 | 75 | 75 | 55.0 | 85.0 | 120.0 | 110.5 | 0.5 | 0.2 | 0.01 | 0.30 | 1,2,3 2-E-64 4 1-E-26 420 | 135 | 135 | 55.0 | 91.0 | 120.0 | 109.7 | 1.0 | 0.3 | 0.24 110 | 65 | 65 | 55.0 | 89.0 | 120.0 | 111.4 | 0.5 | 0.2 | 0.01 | 1-E-27 80 | 50 | 50 | 55.0 | 92.0 | 120.0 | 112.1 | 0.5 | 0.2 | 0.01 | 0.30 | 1,2,3 240 | 125 | 125 | 55.0 | 92.0 | 120.0 | 110.2 | 1.0 | 0.3 | 0.09 325 | 100 | 100 | 55.0 | 95.0 | 120.0 | 111.4 | 1.0 | 0.3 | 0.15 15 | 510 | 300 | 300 | 55.0 | 92.0 | 120.0 | 104.2 | 1.5 | 0.6 | 0.06 | 0.90 | 1,2,3 1-E-28 110 | 65 | 65 | 55.0 | 87.0 | 120.0 | 111.0 | 0.5 | 0.2 | 0.01 | 2-E-67 6 17 | 355 | 200 | 200 | 55.0 | 85.0 | 120.0 | 107.3 | 1.0 | 0.3 | 0.18 445 | 250 | 250 | 55.0 | 91.0 | 120.0 | 107.3 | 1.5 | 0.5 | 0.08 | 0.90 | 1,2,3 1-E-29 450 | 295 | 295 | 55.0 | 88.0 | 120.0 | 105.8 | 1.0 | 0.4 | 0.16 | 0.60 2-E-68 5 20 | 240 | 125 | 125 | 55.0 | 92.0 | 120.0 | 110.2 | 1.0 | 0.3 | 0.09 135 | 135 | 135 | 55.0 | 79.0 | 120.0 | 106.0 | 0.5 | 0.2 | 0.01 | 0.30 | 1,2,3 1-E-30 230 | 150 | 150 | 55.0 | 89.0 | 120.0 | 109.1 | 1.0 | 0.3 | 0.08 | 350 | 175 | 175 | 55.0 | 87.0 | 120.0 | 108.2 | 1.0 | 0.3 | 0.18 85 | 85 | 85 | 55.0 | 83.0 | 120.0 | 110.0 | 0.5 | 0.2 | 0.01 | 0.30 1-E-31 1235 | 595 | 595 | 55.0 | 84.0 | 120.0 | 103.7 | 2.3 | 1.2 | 0.29 | 2-E-70 7 410 | 200 | 200 | 55.0 | 88.0 | 120.0 | 105.8 | 1.0 | 0.4 | 0.14 | 1135 | 990 | 990 | 55.0 | 85.0 | 120.0 | 100.0 | 3.5 | 1.9 | 0.37 1-E-32 12 85 | 60 | 60 | 55.0 | 89.0 | 120.0 | 111.4 | 0.5 | 0.2 | 0.01 350 | 200 | 200 | 55.0 | 85.0 | 120.0 | 107.3 | 1.0 | 0.3 | 0.18 2-E-71 1-E-33 110.7 | 1.0 | 0.2 | 0.01 | 110 | 110 | 110 | 55.0 | 94.0 | 120.0 | 110.9 | 1.0 | 0.3 | 0.02 2-E-72 4 1-E-34 110.5 | 0.5 | 0.2 | 0.01 | 105 | 55 | 55 | 55.0 | 90.0 | 120.0 | 111.7 | 0.5 | 0.2 | 0.01 115 | 75 | 75 | 55.0 | 85.0 | 120.0 | 110.5 | 0.5 | 0.2 | 0.01 220 | 85 | 85 | 55.0 | 83.0 | 120.0 | 110.0 | 0.5 | 0.2 | 0.04 115 | 75 | 75 | 55.0 | 85.0 | 120.0 | 110.5 | 0.5 | 0.2 | 0.01 205 | 110 | 110 | 55.0 | 94.0 | 120.0 | 110.9 | 1.0 | 0.3 | 0.07 115 | 75 | 75 | 55.0 | 85.0 | 120.0 | 110.5 | 0.5 | 0.2 | 0.01 | 0.30 EX | 600 | 180 | 180 | 55.0 | 85.0 | 120.0 | 100.0 | 1.2 | 2.5 | 0.25 | 0.70 | 1,2,3,4 350 | 175 | 175 | 55.0 | 87.0 | 120.0 | 108.2 | 1.0 | 0.3 | 0.18 EX | 600 | 180 | 180 | 55.0 | 85.0 | 120.0 | 100.0 | 1.2 | 2.5 | 0.25 | 0.70 | 1,2,3,4 115 | 75 | 75 | 55.0 | 85.0 | 120.0 | 110.5 | 0.5 | 0.2 | 0.01 | 1-E-40 EX | 120 | 80 | 80 | 55.0 | 84.0 | 120.0 | 110.2 | 0.5 | 0.2 | 0.01 | 0.30 20 | 230 | 125 | 125 | 55.0 | 92.0 | 120.0 | 110.2 | 1.0 | 0.3 | 0.08 EX | 225 | 85 | 85 | 55.0 | 85.0 | 120.0 | 100.0 | 0.4 | 1.9 | 0.25 | 0.24 | 1,2,3,4 1-E-41 | EX | EX 120 | 80 | 80 | 55.0 | 94.0 | 120.0 | 112.5 | 0.5 | 0.2 | 0.01 | 0.30 2-E-82 | 5 20 | 230 | 150 | 150 | 55.0 | 89.0 | 120.0 | 109.1 | 1.0 | 0.3 | 0.08 EX | 200 | 60 | 60 | 55.0 | 85.0 | 120.0 | 100.0 | 0.4 | 2.0 | 0.25 | 0.24 | 1,2,3,4 1-E-42 EX 110 | 60 | 60 | 55.0 | 89.0 | 120.0 | 111.4 | 0.5 | 0.2 | 0.01 | 0.30 20 | 230 | 150 | 150 | 55.0 | 89.0 | 120.0 | 109.1 | 1.0 | 0.3 | 0.08 2-E-83 5 EX | 250 | 75 | 75 | 55.0 | 85.0 | 120.0 | 100.0 | 1.0 | 2.5 | 0.25 | 0.60 | 1,2,3,4 1-E-43 EX EX 275 80 80 55.0 85.0 120.0 100.0 0.3 1.5 0.25 0.90 1,2,3,4 110 | 60 | 60 | 55.0 | 89.0 | 120.0 | 111.4 | 0.5 | 0.2 | 0.01 | 325 | 175 | 175 | 55.0 | 87.0 | 120.0 | 108.2 | 1.0 | 0.3 | 0.15 120 | 75 | 75 | 55.0 | 85.0 | 120.0 | 110.5 | 0.5 | 0.2 | 0.01 | 0.30 14 | 345 | 175 | 175 | 55.0 | 90.0 | 120.0 | 106.8 | 1.0 | 0.4 | 0.10 EX | 150 | 50 | 50 | 55.0 | 85.0 | 120.0 | 100.0 | 0.4 | 1.8 | 0.25 | 0.24 | 1,2,3,4 2-E-85 | 7 | 1-E-45 EX 115 | 75 | 75 | 55.0 | 85.0 | 120.0 | 110.5 | 0.5 | 0.2 | 0.01 20 | 315 | 175 | 175 | 55.0 | 87.0 | 120.0 | 108.2 | 1.0 | 0.3 | 0.15 EX | 200 | 60 | 60 | 55.0 | 85.0 | 120.0 | 100.0 | 0.4 | 2.0 | 0.25 | 0.24 | 1,2,3,4 1-E-46 EX 27 | 225 | 150 | 150 | 55.0 | 89.0 | 120.0 | 109.1 | 1.0 | 0.3 | 0.08 120 | 80 | 80 | 55.0 | 84.0 | 120.0 | 110.2 | 0.5 | 0.2 | 0.01 | 1-E-47 EX 225 | 150 | 150 | 55.0 | 89.0 | 120.0 | 109.1 | 1.0 | 0.3 | 0.08 1-E-48 EX 120 | 75 | 75 | 55.0 | 85.0 | 120.0 | 110.5 | 0.5 | 0.2 | 0.01 1,2,3,4 1-E-49 17 | 240 | 200 | 200 | 55.0 | 88.0 | 120.0 | 105.8 | 1.0 | 0.4 | 0.05 115 | 75 | 75 | 55.0 | 85.0 | 120.0 | 110.5 | 0.5 | 0.2 | 0.01 1-E-50 EX 1,2,3,4 115 | 75 | 75 | 55.0 | 85.0 | 120.0 | 110.5 | 0.5 | 0.2 | 0.01 | 18 | 110 | 70 | 70 | 55.0 | 86.0 | 120.0 | 110.7 | 0.5 | 0.2 | 0.01 1-E-51 EX 115 | 75 | 75 | 55.0 | 85.0 | 120.0 | 110.5 | 0.5 | 0.2 | 0.01 | 0.30 NOTES: 1. BASED ON TITUS MODEL DESV. 1,2,3,4 2. DISCONNECT SWITCH. 115 75 75 55.0 85.0 120.0 110.5 0.5 0.2 0.01 1,2,3,4 1-E-54 220 220 3. PROVIDE ELECTRICAL POWER FOR STEP DOWN TRANSFORMER. EX FULLY SPRINKLERED Project Number

one eighth inch = one toot

0 4 8 16

VA FORM 08-623

Clark• Nexsen Architecture & Engineering

CONSULTANT ENGINEER:

1111 E MAIN STREET, SUITE 1905 RICHMOND, VA 23219 PHONE: 804.644.4690

70 | 45 | 45 | 55.0 | 94.0 | 120.0 | 112.5 | 0.5 | 0.2 |

 115
 75
 75
 55.0
 85.0
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 0.5
 0.2

3



4



131 HANBURY ROAD, SUITE C CHESAPEAKE, VA 23322 PHONE: 757.389.5518 Drawing Title
SCHEDULES Mental Health Recovery 310 **Enhancement Center Building Number** HH McGuire VA Medical Center 500 Approved: Project Director Drawing Number Location Richmond, VA Checked M-602 08.24.12 FOR CONSTRUCTION

Office of Construction and Facilities Management

VOL. REG. (CFM)

320 | 320 | 320 | 55.0 | 79.0

115 | 75 | 75 | 55.0 | 85.0 | 120.0

115 | 75 | 75 | 55.0 | 85.0 | 120.0

MARK | DIA (IN) | INLET SP | RADIATED | MAX. | MIN. | HTG |

2-E-3

2-E-17 4

2-E-28

2-E-36 4

2-E-39 | 4

2-E-44

2-E-45

0.04

0.02

0.04

0.04

0.04

0.04

AIR TEMP

HEATING COIL

LVG.

MAX

MAX WPD

GPM (FT)

107.0 | 1.3 | 0.5 |

109.5 | 1.0 | 0.3 |

WATER TEMP

120.0

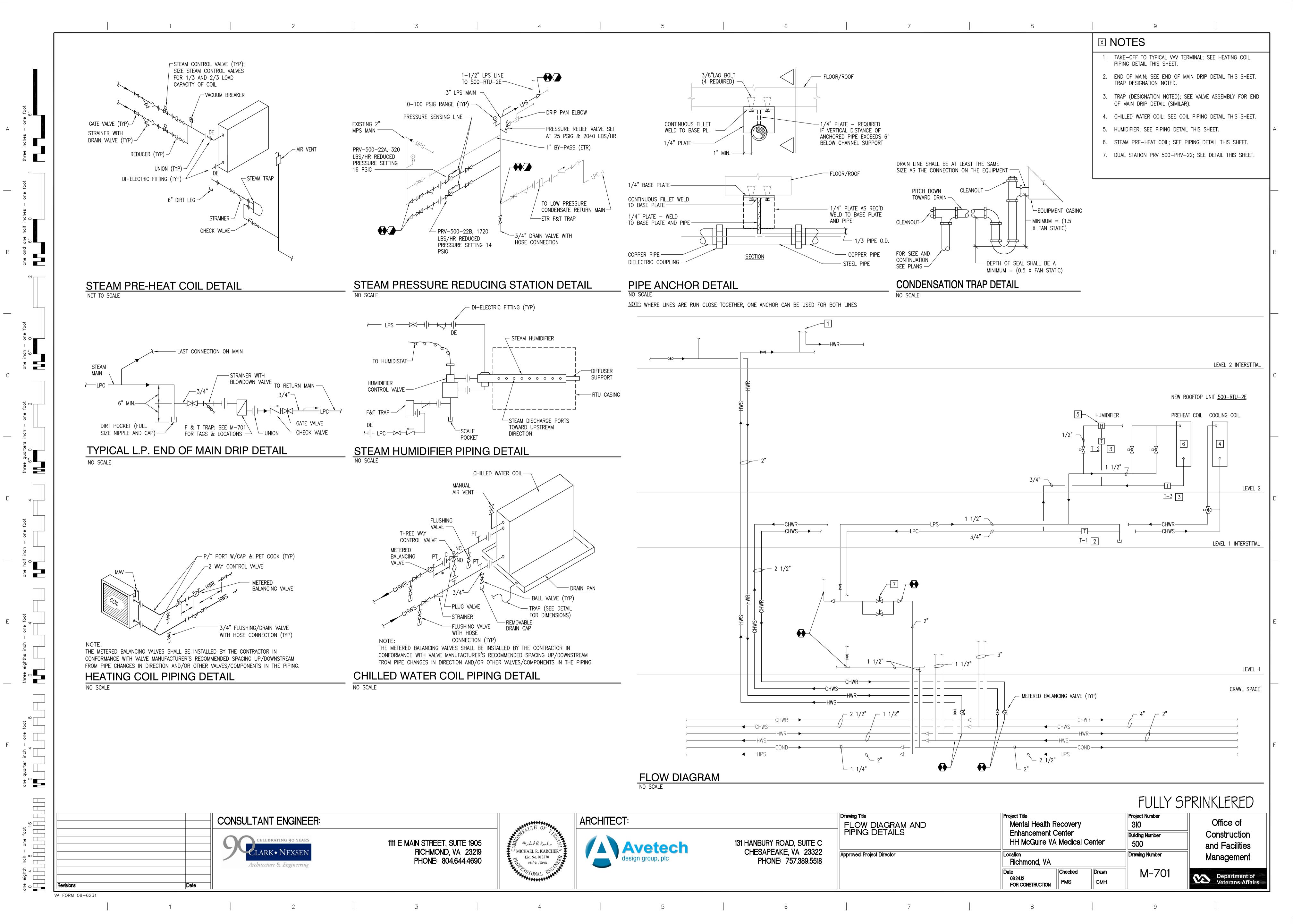
110.5 | 0.5 | 0.2 |

FIRST FLOOR SHUT OFF VARIABLE AIR VOLUME BOX SCHEDULE (2 OF 2)

5

СМН

Department of Veterans Affairs



1. GENERAL

1.1 UNIT IS NORMALLY STARTED AND STOPPED REMOTELY AT THE BAS. H-O-A SWITCH SHALL BE KEPT IN THE -AUTO- POSITION. "HAND- AND OFF" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF", OAD-O & EAD-O DAMPERS, SHALL BE FULLY CLOSED. WHEN THE UNIT IS "ON" SMOKE DAMPER SD-1 & SD-2 SHALL BE FULLY OPEN. CONTROL DAMPERS SHALL MODULATE IN ACCORDANCE WITH THE FOLLOWING SEQUENCE:

2. TEMPERATURE CONTROL

- 2.1 SUPPLY AIR TEMPERATURE, SENSED BY DA-T, SHALL BE MAINTAINED AT SETPOINT VIA DIGITAL CONTROL PANEL BY MODULATING CLG-O OR OAD-O AND RAD-O OR PH-O IN SEQUENCE.
- 2.2 WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY THE GLOBAL SYSTEM, IS ABOVE 75°F (ADJ), THE DIGITAL CONTROL PANEL SHALL PREVENT THE MODULATION OF RAD-O AND EAD-O AND SHALL ASSUME THE MINIMUM OUTSIDE AIR POSITION (RAD-O FULLY OPENED AND EAD-O FULLY CLOSED). THE DIGITAL CONTROL PANEL SHALL MODULATE CLG-O TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY DA-T.
- 2.3 WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY THE GLOBAL SYSTEM, IS BETWEEN 65°F AND THE SUPPLY AIR TEMPERATURE SENSED BY DA-T, DAMPER RAD-O SHALL FULLY CLOSE AND OAD-O AND EAD-O SHALL BE FULLY OPEN (MAXIMUM OUTSIDE AIR POSITION). THE DIGITAL CONTROL PANEL SHALL MODULATE CLG-O TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY DA-T.
- 2.4 WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY OA-T, IS BELOW THE SUPPLY AIR TEMPERATURE, SENSED BY DA-T DAMPERS OAD-O, RAD-O AND EAD-O SHALL MODULATE TO MAINTAIN THE SCHEDULED SUPPLY AIR TEMPERATURE. IF RAD-O IS OPEN AND OAD-O IS CLOSED TO MINIMUM OUTSIDE AIR, PH-O SHALL MODULATE OPEN TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY DA-T.

3. AIR FLOW CONTROL

- 3.1 THE SUPPLY AIR FLOW SHALL BE CONTROLLED BY THE DIGITAL CONTROL PANEL MODULATING THE SUPPLY FAN VARIABLE SPEED MOTOR CONTROLLER TO MAINTAIN 1.00" WG OF DUCT STATIC PRESSURE (FIELD ADJUSTABLE), SENSED BY DA1-P. RESET STATIC PRESSURE BASED ON ACTUAL BUILDING LOAD BY POLLING ALL VAV BOXES.
- 3.2 THE DIGITAL CONTROL PANEL. USING TOTAL SUPPLY AIR, OUTDOOR AIR AND RETURN AIR FLOW SIGNALS, SHALL RESET THE RETURN AIR FAN VFD TO MAINTAIN A CONSTANT AIR FLOW DIFFERENCE BETWEEN THE SUPPLY AIR AND THE RETURN AIR EQUAL TO MINIMUM OUTSIDE AIR.
- 3.3 USING HIGH PRESSURE SENSOR 'SF-P' LOCATED AT THE SUPPLY FAN DISCHARGE, SHALL PREVENT THE SUPPLY FAN FROM DEVELOPING OVER 3" OF STATIC PRESSURE (FIELD ADJUSTABLE). IF STATIC PRESSURE AT SF-P DOES EXCEED 3" THE SUPPLY AIR FAN SHALL STOP. DAPHI—A SHALL BE HARDWIRED TO THE SUPPLY FAN VFD AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO OR BYPASS MODE. DAPHI—A WILL REQUIRE MANUAL RESET AT THE DEVICE.

4 HUMIDITY CONTRO

- 4.1 WHEN THE DIGITAL CONTROL PANEL (DCP) IS NOT CALLING FOR HUMIDITY. SENSED BY RETURN AIR HUMIDITY RA-H. 2-WAY "ON-OFF" ISOLATION VALVE HUM-C SHALL REMAIN CLOSED. WHEN THE DIGITAL CONTROL PANEL IS CALLING FOR HUMIDITY. HUM-C SHALL REMAIN OPEN.
- 4.2 RETURN AIR HUMIDITY SHALL BE MAINTAINED AT SETPOINT OF 20% RH (ADJ) VIA DIGITAL CONTROL PANEL BY MODULATING CONTROL VALVE HUM-O TO MAINTAIN THE DESIRED HUMIDITY. THE DCP SHALL OVERRIDE THIS CONTROL TO MAINTAIN HUMIDITY OF 80% AS SENSED BY DA-H. DCP SHALL CLOSE VALVE HUM-C WHENEVER THE SUPPLY FAN IS OFF. VALVE HUM-O SHALL BE INTERLOCKED WITH A TEMPERATURE SWITCH TO KEEP THE HUMIDIFIER OFF UNTIL CONDENSATE TEMPERATURE APPROACHES STEAM TEMPERATURE.

5. FREEZE PROTECTION

5.1 IF THE AIR TEMPERATURE AS SENSED BY PH-T FALLS BELOW 45°F. AN ALARM SIGNAL SHALL INDICATE AT THE DCP AND BAS. IF THIS TEMPERATURE FALLS BELOW 40°F AS SENSED BY THE LT-A, THE SUPPLY AND RETURN FANS SHALL SHUT DOWN AND A CRITICAL ALARM SHALL INDICATE AT THE DIGITAL CONTROL PANEL AND BAS. LT-A SHALL BE HARDWIRED TO THE SUPPLY FAN VFD AND UNIT SHALL BE SHUTDOWN IN HAND, AUTO OR BYPASS MODE. LT-A WILL REQUIRE MANUAL RESET AT THE DEVICE.

6. AUTOMATIC SHUTDOWN/RESTART

- 6.1 WHEN SMOKE IS DETECTED BY DUCT SMOKE DETECTOR, RA—SD OR DA—SD, THE SUPPLY AND RETURN FANS SHALL SHUT "OFF" AND AN ALARM SIGNAL SHALL BE TRANSMITTED TO THE FIRE ALARM SYSTEM. ALL SMOKE DAMPERS IN THE SUPPLY AND RETURN DUCTS SHALL CLOSE.
- 6.2 EXHAUST FANS SERVING AREA OF THE SUPPLY FAN SHALL CONTINUE TO RUN. SUPPLY AND RETURN FANS SHALL RESTART AND SMOKE DAMPERS SHALL OPEN WHEN FIRE ALARM CIRCUIT IS RESET.

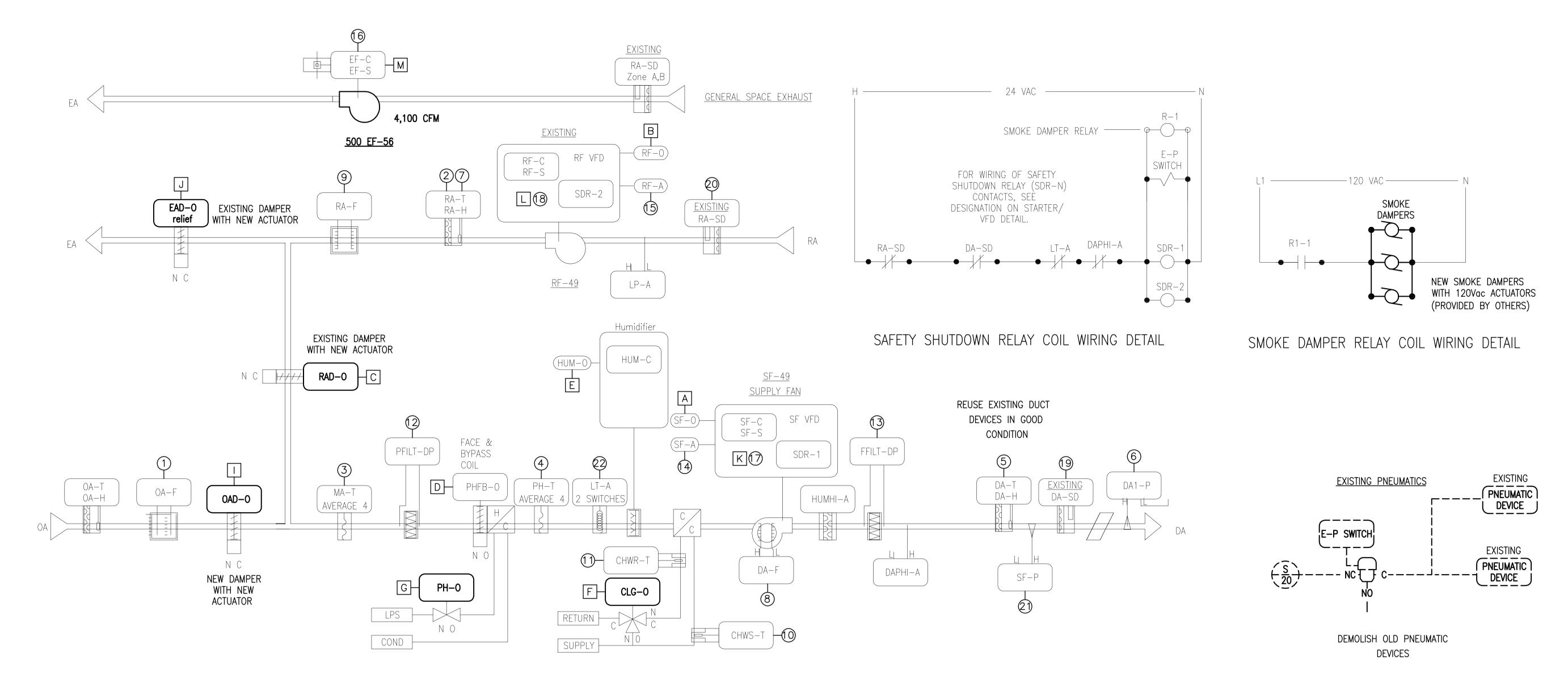
7. EMERGENCY CONSTANT SPEED OPERATION

7.1 UPON FAILURE OF THE VFD. THE SUPPLY AND RETURN FANS SHALL BE STARTED/STOPPED MANUALLY AT THE DIGITAL CONTROL PANEL OR THE BAS THROUGH THE BY—PASS STARTER. FANS SHALL THEN BE OPERATED AT CONSTANT SPEED.

GENERAL CONTROL NOTES

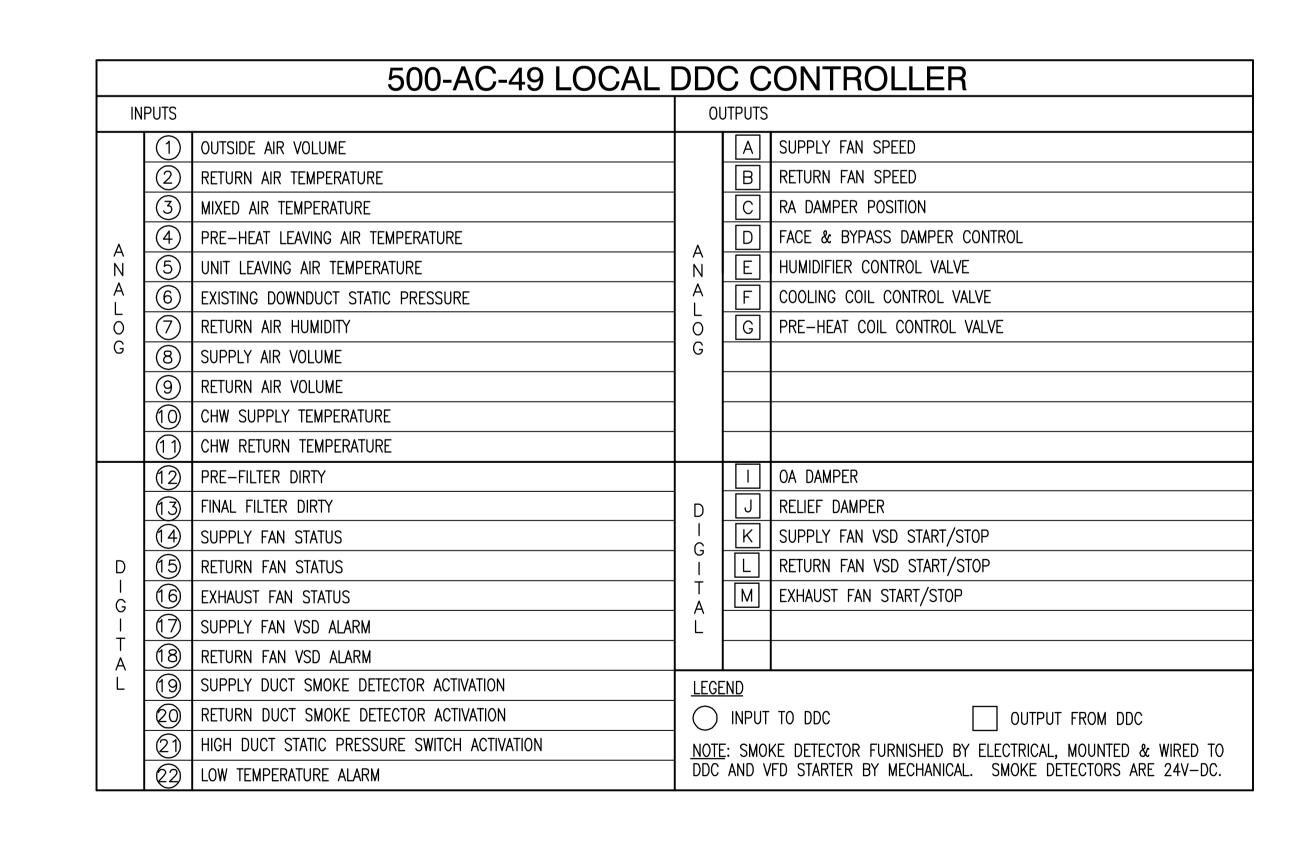
EXISTING DDC CONTROLS SYSTEM:

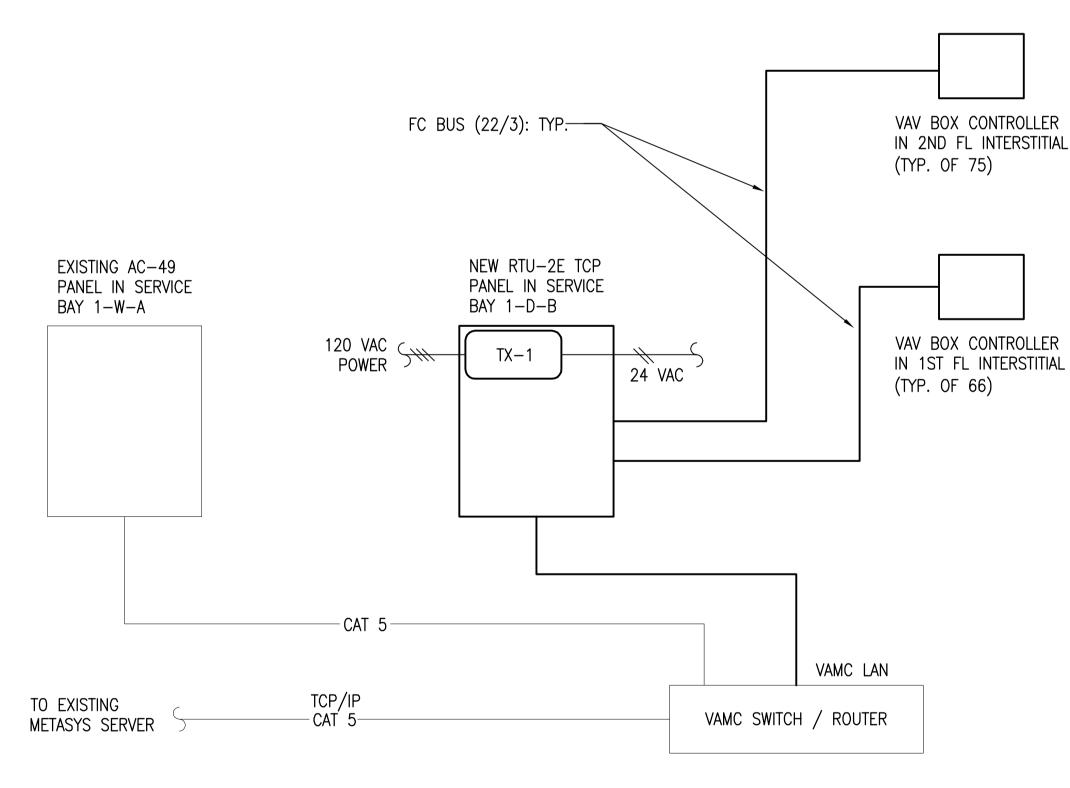
- McGUIRE VAMC RICHMOND HAS A JCI "METASYS" DDC SYSTEM THAT SHALL BE RE-USED FOR THE RENOVATION PROJECT AND CONNECTED TO FOR THE NEW ADDITION: INCLUDE LABOR FOR VERIFICATION THAT THE EXISTING DDC CONTROLS ARE FUNCTIONAL AND CALIBRATED FOR THE EXISTING CONTROL SET-POINTS. INCLUDE REPLACEMENT OF EXISTING PNEUMATIC CONTROL ACTUATORS WITH ELECTRIC ACTUATORS.
- SEE DEDUCT ALTERNATE BID ITEM # 12 FOR REPLACEMENT OF EXISTING VAV TERMINALS WITH PNEUMATIC CONTROLS IN THE FIRST FLOOR INTERSTITIAL LEVEL WITH NEW VAV TERMINALS WITH DDC CONTROLS. INCLUDE PRICING FOR DDC CONTROLS UP—GRADE WITH DEDUCT ALTERNATE BID PRICE PACKAGE.



500-AC-49 FLOW DIAGRAM

NOTE: ITEMS SHOWN BOLD IN DIAGRAM ARE NEW, WHILE OTHER ITEMS ARE EXISTING TO REMAIN





DDC SYSTEM ARCHITECTURE

- DDC VENDOR TO CONNECT VAV BOX MCA CONTROLLERS TO THE NAE-4500 AND CONNECT CAT5 TCP/IP TO RTU-2E PANEL TO COMMUNICATE BACK TO THE JOHNSON CONTROLS BAS SERVER OPERATOR WORKSTATION. INCLUDE:
 - GRAPHICS (ALL SYSTEMS WITH DYNAMIC VALUES)
 SCHEDULING (OCCUPIED MODE START/STOP TIMES)
 TRENDING (POINT VALUES)
 ALARM FAILURE & STATUS REPORTING

SETPOINT ADJUSTMENT

FULLY SPRINKLERED

								I ULLI I	OFRINKLLKLU
	CONSULTANT ENGINEER:		TH OR	ARCHITECT:		Drawing Title CONTROLS	Project Title Mental Health Recovery	Project Number 310	Office of
	CELEBRATING 90 YEARS	1111 E MAIN STREET, SUITE 1905	Michael R. Karcher Z	Avetech	131 HANBURY ROAD, SUITE C		Enhancement Center HH McGuire VA Medical Center	Building Number 500	Construction and Facilities
	CLARK • NEXSEN Architecture & Engineering	RICHMOND, VA 23219 PHONE: 804.644.4690	© MICHAEL R. KARCHER Lic. No. 013270 08/21/2012	design group, plc	CHESAPEAKE, VA 23322 PHONE: 757.389.5518	Approved: Project Director	Location Richmond, VA	Drawing Number	Management
			SSIONAL ENG				Date 08.24.12 FOR CONSTRUCTION PMS CMH	M-801	Department of
Revisions: Date							FOR CONSTRUCTION FMS CMH		VGIGIAIIS AIIAIIS

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4

VA FORM 08-6231

1. <u>GENERAL</u>

1.1 UNIT IS NORMALLY STARTED AND STOPPED REMOTELY AT THE BAS. H-O-A SWITCH SHALL BE KEPT IN THE -AUTO- POSITION. "HAND- AND OFF" POSITIONS SHALL BE USED ONLY FOR MAINTENANCE. WHEN THE UNIT IS "OFF", OAD-O & EAD-O DAMPERS SHALL BE FULLY CLOSED AND RAD-O SHALL BE FULLY OPEN. WHEN THE UNIT IS "ON" SMOKE DAMPERS SD-1 & SD-2 SHALL BE FULLY OPEN. PROVIDE END SWITCHES ON SMOKE DAMPERS AND OAD-O & EAD-O DAMPERS, SO THAT FANS WILL NOT START UNTIL DAMPERS ARE OPEN. CONTROL DAMPERS SHALL MODULATE IN ACCORDANCE WITH THE FOLLOWING SEQUENCE:

2. TEMPERATURE CONTROL

2.1 SUPPLY AIR TEMPERATURE, SENSED BY DA-T, SHALL BE MAINTAINED AT SETPOINT VIA DIGITAL CONTROL PANEL BY MODULATING CLG-O OR OAD-O AND RAD-O OR PH-1 & PH-2 IN SEQUENCE.

2.2 WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY THE GLOBAL SYSTEM, IS ABOVE 75°F (ADJ), THE DIGITAL CONTROL PANEL SHALL PREVENT THE MODULATION OF RAD-O AND EAD-O AND SHALL ASSUME THE MINIMUM OUTSIDE AIR POSITION (RAD-O FULLY OPENED AND EAD-O FULLY CLOSED). THE DIGITAL CONTROL PANEL SHALL MODULATE CLG-O TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY DA-T.

2.3 WHEN THE TEMPERATURE OF THE OUTSIDE AIR, SENSED BY THE GLOBAL SYSTEM, IS BETWEEN 65°F AND THE SUPPLY AIR TEMPERATURE SENSED BY DA-T, DAMPER RAD-O SHALL FULLY CLOSE AND OAD-O AND EAD-O SHALL BE FULLY OPEN (MAXIMUM OUTSIDE AIR POSITION). THE DIGITAL CONTROL PANEL SHALL MODULATE CLG-O TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY DA-T.

2.4 WHEN THE TEMPERATURE OF THE OUTSIDE AIR SENSED BY OA-T IS BELOW THE SUPPLY AIR TEMPERATURE SENSED BY DA-T, DAMPERS OAD-O, RAD-O AND EAD-O SHALL MODULATE TO MAINTAIN THE SCHEDULED SUPPLY AIR TEMPERATURE. IF RAD-O IS OPEN AND OAD-O IS CLOSED TO MINIMUM OUTSIDE AIR, PH-1 SHALL MODULATE OPEN TO MAINTAIN THE SUPPLY AIR TEMPERATURE, SENSED BY DA-T. IF PH-1 CANNOT MAINTAIN SETPOINT, PH-2 SHALL MODULATE OPEN.

2.5 TEMPERATURE CONTROL RE—SET: THE DISCHARGE AIR TEMPERATURE SETPOINT WILL BE RESET AS THE OUTDOOR AIR TEMPERATURE CHANGES (SETPOINT WILL BE ADJUSTABLE).

2.6 NIGHT SETBACK/NIGHT SETUP: WHEN IN "UNOCCUPIED" MODE, THE UNIT WILL CYCLE AS NECESSARY TO MAINTAIN THE SHARED NIGHT SETBACK ZONE TEMPERATURE AT SETPOINT. A DIFFERENTIAL PREVENTS THE UNIT FROM CYCLING EXCESSIVELY.

2.7 WARM-UP/COOL-DOWN MODE: THE WARMUP/COOLDOWN MODE WILL BE INITIATED BY THE NETWORK INPUT THE UNIT WILL CONTROL TO OCCUPIED SETPOINTS DURING WARM-UP AND COOL-DOWN CYCLES.

3. AIR FLOW CONTROL

3.1 THE SUPPLY AIR FLOW SHALL BE CONTROLLED BY THE DIGITAL CONTROL PANEL MODULATING THE SUPPLY FAN VARIABLE SPEED MOTOR CONTROLLER TO MAINTAIN 1.83" WG OF DUCT STATIC PRESSURE (FIELD ADJUSTABLE) AS SENSED BY DA1-P. RESET STATIC PRESSURE BASED ON ACTUAL BUILDING LOAD BY POLLING ALL VAV BOXES.

3.2 THE DIGITAL CONTROL PANEL. USING TOTAL SUPPLY AIR, OUTDOOR AIR AND RETURN AIR FLOW SIGNALS, SHALL RESET THE RETURN AIR FAN VFD TO MAINTAIN A CONSTANT AIR FLOW DIFFERENCE BETWEEN THE SUPPLY AIR AND THE RETURN AIR EQUAL TO MINIMUM OUTSIDE AIR.

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4. <u>HUMIDITY CONTROL</u>

4.1 WHEN THE DIGITAL CONTROL PANEL (DCP) IS NOT CALLING FOR HUMIDITY, AS SENSED BY RETURN AIR HUMIDITY RA—H. 2—WAY "ON—OFF" ISOLATION VALVE HUM—C SHALL REMAIN CLOSED. WHEN THE DIGITAL CONTROL PANEL IS CALLING FOR HUMIDITY, HUM—C SHALL REMAIN OPEN.

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5. FREEZE PROTECTION

VA FORM 08-6231

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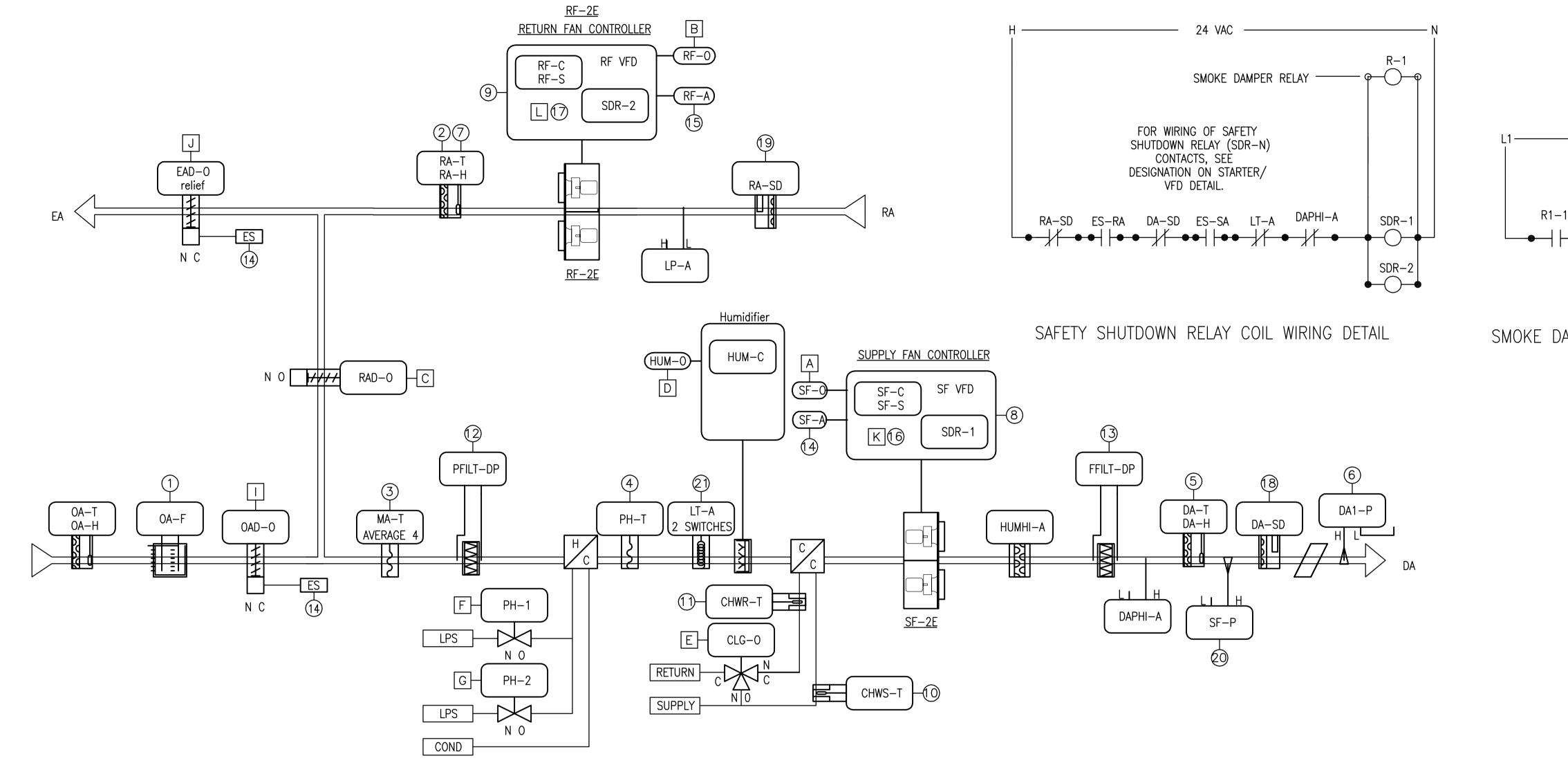
6. AUTOMATIC SHUTDOWN/RESTART

6.1 WHEN SMOKE IS DETECTED BY DUCT SMOKE DETECTOR, RA—SD OR DA—SD, THE SUPPLY AND RETURN FANS SHALL SHUT "OFF" AND AN ALARM SIGNAL SHALL BE TRANSMITTED TO THE FIRE ALARM SYSTEM. ALL SMOKE DAMPERS IN THE SUPPLY AND RETURN DUCTS SHALL CLOSE.

6.2 EXHAUST FANS SERVING AREA OF THE SUPPLY FAN SHALL CONTINUE TO RUN. SMOKE DAMPERS SHALL OPEN WHEN FIRE ALARM CIRCUIT IS RESET, AND WHEN THE END SWITCH IS CLOSED THE SUPPLY AND RETURN FANS SHALL START.

7. EMERGENCY CONSTANT SPEED OPERATION

7.1 UPON FAILURE OF THE VFD, THE SUPPLY AND RETURN FANS SHALL BE STARTED/STOPPED MANUALLY AT THE DIGITAL CONTROL PANEL THROUGH THE BY—PASS STARTER. FANS SHALL THEN BE OPERATED AT CONSTANT SPEED.



SMOKE DAMPER RELAY COIL WIRING DETAIL

—120 VAC ——

DAMPERS

NEW SMOKE DAMPERS

WITH 120Vac ACTUATORS

(PROVIDED BY OTHERS)

500-RTU-2E FLOW DIAGRAM

		500-RTU-2E LOCA		<u>)C</u>	CONTROLLER
IN	PUTS		0	JTPUTS	S
	1	OUTSIDE AIR VOLUME		A	SUPPLY FAN SPEED
	2	RETURN AIR TEMPERATURE		В	RETURN FAN SPEED
	3	MIXED AIR TEMPERATURE		С	RA DAMPER POSITION
Α	4	PRE-HEAT LEAVING AIR TEMPERATURE		D	HUMIDIFIER CONTROL VALVE
Ñ	(5)	UNIT LEAVING AIR TEMPERATURE	☐ A N	E	COOLING COIL CONTROL VALVE
A L	6	EXISTING DOWNDUCT STATIC PRESSURE	A	F	1/3 PRE-HEAT COIL CONTROL VALVE
Ö	7	RETURN AIR HUMIDITY		G	2/3 PRE-HEAT COIL CONTROL VALVE
G	8	SUPPLY AIR VOLUME (FROM SUPPLY FAN CONTROLLER)	G		
	9	RETURN AIR VOLUME (FROM RETURN FAN CONTROLLER)			
	10	CHW SUPPLY TEMPERATURE			
	1	CHW RETURN TEMPERATURE			
	12	PRE-FILTER DIRTY			OA DAMPER
	(3)	FINAL FILTER DIRTY	D	J	RELIEF DAMPER
	14	SUPPLY FAN STATUS	- G	K	SUPPLY FAN VSD START/STOP
D	15	RETURN FAN STATUS	$\frac{1}{2}$		RETURN FAN VSD START/STOP
I G	16	SUPPLY FAN VSD ALARM	A A		
 	17	RETURN FAN VSD ALARM			
A	18	SUPPLY DUCT SMOKE DETECTOR ACTIVATION			
L	19	RETURN DUCT SMOKE DETECTOR ACTIVATION	<u>LEG</u>	<u>END</u>	
	20	HIGH DUCT STATIC PRESSURE SWITCH ACTIVATION		INPU	T TO DDC OUTPUT FROM DDC
	2	LOW TEMPERATURE ALARM			OKE DETECTOR FURNISHED BY ELECTRICAL, MOUNTED & WIRED TO VFD STARTER BY MECHANICAL. SMOKE DETECTORS ARE 24V-DC.

5

FULLY SPRINKLERED

one eighth inch = one foot

0 4 8 16 Drawing Title ARCHITECT: CONSULTANT ENGINEER: CONTROLS 1111 E MAIN STREET, SUITE 1905 131 HANBURY ROAD, SUITE C CHESAPEAKE, VA 23322 RICHMOND, VA 23219 CLARK• NEXSEN MICHAEL R. KARCHER Approved: Project Director Lic. No. 013270 PHONE: 804.644.4690 PHONE: 757.389.5518 08/21/2012 Architecture & Engineering

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Project Number 310 Office of

Building Number

Drawing Number

M-802

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Construction

and Facilities

Management

Department of Veterans Affairs

Mental Health Recovery

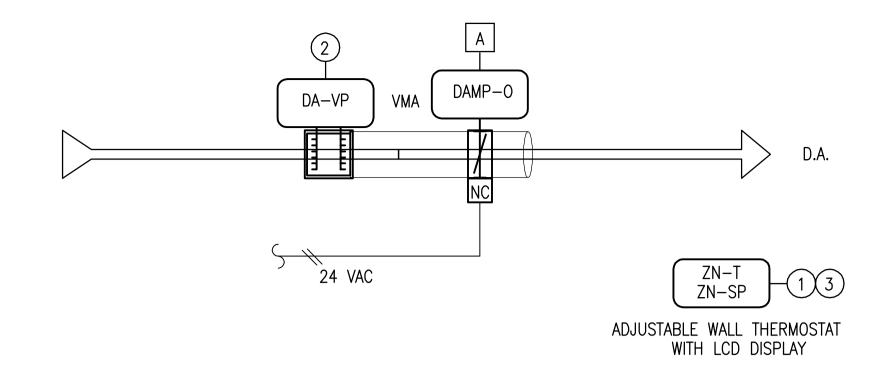
HH McGuire VA Medical Center

Enhancement Center

Richmond, VA

08.24.12 FOR CONSTRUCTION

Location



COOLING ONLY VAV TERMINAL FLOW DIAGRAM

COOLING ONLY VAV TERMINAL SEQUENCE OF OPERATION

SETPOINTS SHALL BE AS FOLLOWS:

COOLING SETPOINT 75 °F (ADJ.)

HEATING SETPOINT NOT USED, BOX IS COOLING ONLY.

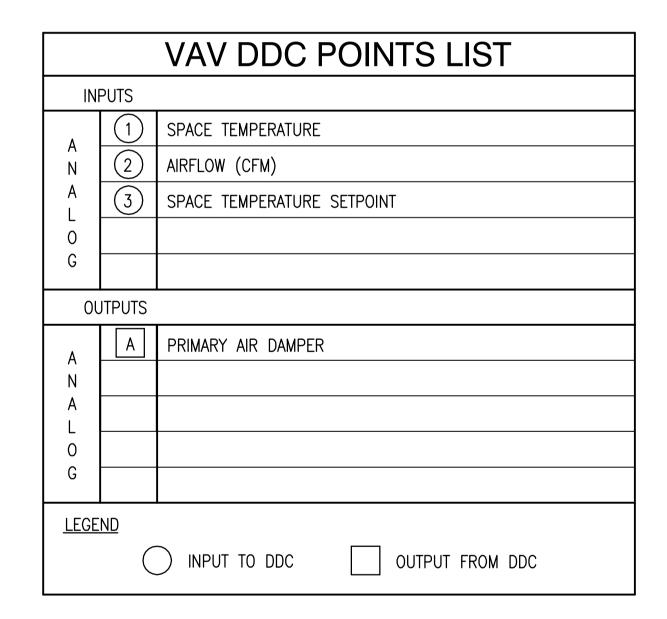
UPON A FALL IN SPACE TEMPERATURE BELOW COOLING SETPOINT, THE VAV DAMPER POSITION WILL MODULATE TO MAINTAIN AIR FLOW SETPOINT.

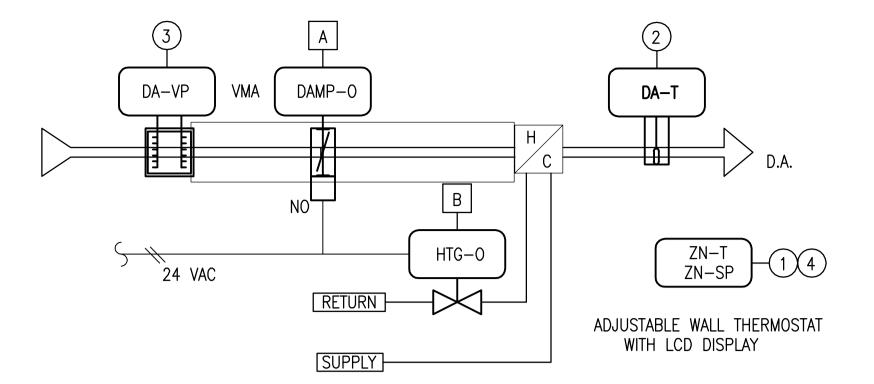
UPON A RISE IN SPACE TEMPERATURE ABOVE COOLING SETPOINT, THE VAV DAMPER POSITION WILL MODULATE OPEN, THE AIR FLOW WILL VARY BETWEEN THE MINIMUM AND MAXIMUM AIR FLOW TO MAINTAIN COOLING SETPOINT

UPON A FUTHER RISE IN SPACE TEMPERATURE THE VAV BOX WILL MAINTAIN MAXIMUM AIR FLOW SETPOINT.

THE COOLING ONLY VAV BOXES WILL INCLUDE PROGRAMMING FOR REVERSE-ACTION WHEN WARM AIR IS SUPPLIED TO THE BOX (DURING MORNING WARM-UP OPERATION).

COORDINATE WITH ELECTRICAL CONTRACTOR FOR POWER WIRING TO STEP-DOWN TRANSFORMER(S). 24 VAC WIRING FOR BOX ACTUATORS AND CONTROL VALVES BY DDC VENDOR.





VAV TERMINAL WITH HOT WATER HEATING COIL FLOW DIAGRAM

VAV RE-HEAT TERMINAL SEQUENCE OF OPERATION

SET POINT SHALL BE SET AS FOLLOWS:

COOLING SETPOINT IS 75°F (ADJ.) DEADBAND OF 5°F BETWEEN HEATING AND COOLING SETPOINTS WILL BE MAINTAINED. HEATING SETPOINT IS 70°F (ADJ.)

UPON A RISE IN SPACE TEMPERATURE ABOVE COOLING SETPOINT, THE HEATING VALVE WILL REMAIN CLOSE AND THE VAV DAMPER POSITION WILL MODULATE OPEN, THE AIR FLOW WILL VARY BETWEEN THE MINIMUM AIR FLOW AND MAXIMUM AIR FLOW CFM TO MAINTAIN COOLING SETPOINT.

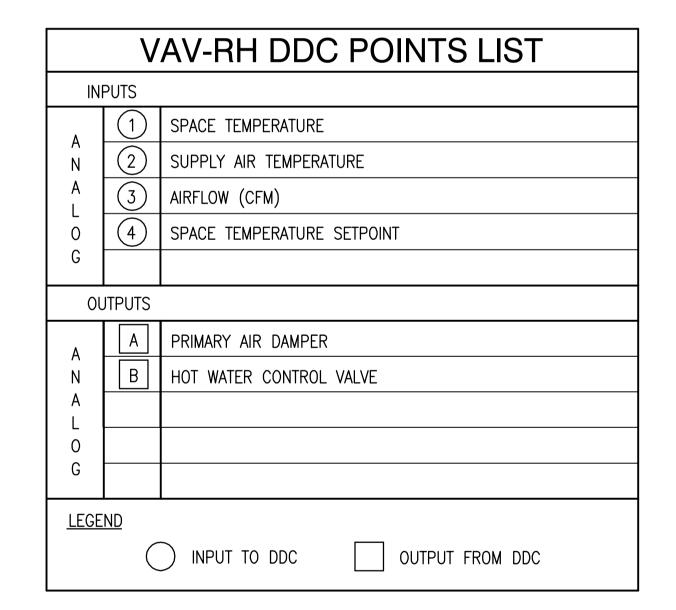
WHEN THE SPACE TEMPERATURE IS BETWEEN THE COOLING SETPOINT AND THE HEATING SETPOINT, THE VAV DAMPER WILL MODULATE TO MINIMUM AIR FLOW POSITION, AND THE HEATING VALVE SHALL REMAIN CLOSE.

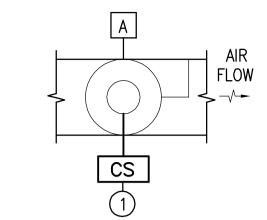
POSITION, AND THE HEATING VALVE WILL MODULATE TO MAINTAIN THE HEATING SETPOINT WITHIN ±0.5°F (ADJ.). THE ADJUSTABLE TOLERANCE OF ±0.5°F HAS BEEN SELECTED TO PREVENT VALVE HUNTING.

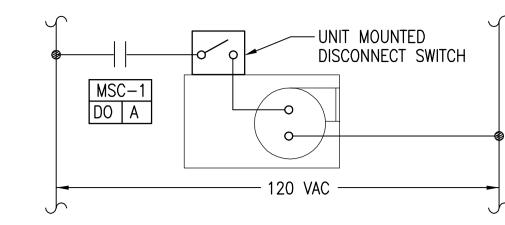
THE REVERSE SHALL OCCUR ON THE RISE IN SPACE TEMPERATURE.

DURING MORNING WARM-UP OPERATION, THE VAV TERMINAL WILL OPEN FULLY AND THE HOT WATER CONTROL VALVE SHALL GO INTO HEATING MODE UNTIL OCCUPIED TEMPERATURE IS REACHED.

COORDINATE WITH ELECTRICAL CONTRACTOR FOR POWER WIRING TO STEP-DOWN TRANSFORMER(S). 24 VAC WIRING FOR BOX ACTUATORS AND CONTROL VALVES BY DDC VENDOR.







EF-1E CONTROL DIAGRAM

EF-1E CONTROL CIRCUIT

EXHAUST FAN FLOW DIAGRAM

EXHAUST FAN SEQUENCE OF OPERATION

EXHAUST FAN EF-1E (NOTE: EF-2E & EF-3E SIMILAR)

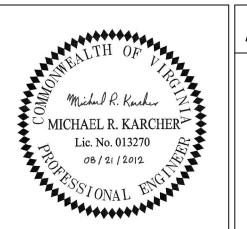
WHEN THE UNIT MOUNTED DISCONNECT SWITCH IS IN THE "OFF" POSITION THE FAN SHALL BE DEACTIVATED. WHEN THE DISCONNECT SWITCH IS IN THE "ON" POSITION THE FAN SHALL BE MONITORED AND CONTROLLED BY THE DDC SYSTEM. THE DDC SYSTEM SHALL ENABLE/DISABLE THE FAN THROUGH ITS START/STOP RELAY.

	MSC-1 DDC CONTROLLER							
INF	PUTS							
D	(EF-1E STATUS - CURRENT SWITCH (ADJUSTABLE W/ LED)						
l G	2	EF-2E STATUS - CURRENT SWITCH (ADJUSTABLE W/ LED)						
1	3	EF-3E STATUS - CURRENT SWITCH (ADJUSTABLE W/ LED)						
T A								
L								
OL	JTPUTS							
D	Α	EF-1E START/STOP						
l G	В	EF-2E START/STOP						
1	C EF-3E START/STOP							
T A								
Ĺ								
LEGE	<u>LEGEND</u>							
		INPUT TO DDC OUTPUT FROM DDC						

FULLY SPRINKLERED

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Drawing Title Mental Health Recovery CONTROLS **Enhancement Center Building Number** HH McGuire VA Medical Center 500 Approved: Project Director Drawing Number Richmond, VA M-803 08.24.12 FOR CONSTRUCTION СМН

Construction and Facilities Management

Office of

VA FORM 08-6231

one eighth inch = one foot

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Department of Veterans Affairs